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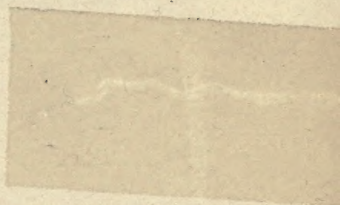
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DISEASES OF WOMEN.

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DISEASES OF WOMEN:

INCLUDING

THEIR PATHOLOGY, CAUSATION, SYMPTOMS,
DIAGNOSIS, AND TREATMENT.

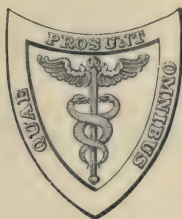
A MANUAL FOR STUDENTS AND PRACTITIONERS.

BY

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WITH ONE HUNDRED AND FORTY-EIGHT ILLUSTRATIONS.



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PREFACE.

IN the following pages I have attempted to present to the student and junior practitioner such an account of the diseases incidental to women as will prove a reliable, practical clinical guide.

Those who, from lack of time or opportunity during their student career, neglected to make themselves familiar with a subject which will form a most important item in the daily routine of ordinary practice, may thus be enabled to repair the omission.

My endeavor has been to give an impartial account, and if, in dealing with the subject of displacements of the uterus, too much prominence should appear to have been given to their mechanical treatment, it has been in order that the question should be fairly represented, not that the practitioner is recommended to place too great reliance upon mechanical appliances.

The task of condensing within the limits of a manual all that has stood the test of time and experience in this specialty, has been a difficult one. Doubtless many omissions will be found. Still, I trust these may be rectified by encouraging the student to investigate the subject of gynecology more exhaustively in larger works.

I have to acknowledge my own indebtedness for much valuable information to Dr. Barnes's "Clinical History of the Medical and Surgical Diseases of Women," Dr. T. Gaillard Thomas's "Practical Treatise on the Diseases of Women," and other similar works duly acknowledged in the text.

The diagnosis of abdominal tumors being generally one of much difficulty to the student, has been given most exhaustively. The functional disorders have also been entered into at some length,

necessitating, of course, much repetition; but as the young practitioner is often compelled to study disease from its clinical aspect, this portion of the work will not, I feel sure, be unappreciated.

The illustrations chiefly consist of outline diagrams representing the various displacements of the uterus, methods of operation in cases of ruptured perineum and vesico-vaginal fistulæ, and differential diagnosis of tumors. Figures of instruments likely to be of service to the practitioner have been incorporated in the text, as being far more useful than letter-press descriptions. Many of the makers' names appear upon these, but where not indicated I am indebted to the courtesy of Messrs. Krohne and Seseman.

A copious index is appended, to facilitate reference, and every effort has been made to render the work practically useful to the busy practitioner.

A. W. E.

22 WIMPOLE STREET, W.,
September, 1881.

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DISEASES OF WOMEN.

CHAPTER I.

INTRODUCTORY.

IN Gynecology, to insure success, it is essential to gain the confidence of your patient; this can only be acquired by practice, and the sooner the student learns the difference between gaining a knowledge of the science and the art of his profession, the one mutually assisting the other, the sooner will he be in a position to reconcile the subjective symptoms with the objective signs, and to ascribe to each their proper value and import.

Rational signs, which appeal to our reason and not to our senses, such as pain in the back, bearing down, etc., will often direct our attention specially to the pelvic organs, and lead us to infer the existence of disease there, which is confirmed or otherwise by the employment of certain "physical" examinations to be hereafter described.

In no specialty is it so important to combine the *suaviter in modo* with the *fortiter in re*, for unless the practitioner be kind and sympathetic, he will fail to elicit the symptoms he is expected to treat, or to gain the confidence that is so essential to success; and, on the other hand, unless he be firm and decided his patient will despise him and not follow his instructions.

He should be extremely neat and cleanly in the performance of all examinations, minor operations, dressings, etc., for patients are naturally indignant at finding stains of nitrate of silver or other agents on their towels and personal linen, and are apt to consider them as a proof of a want of knowledge as well as of dexterity and practice.

It has been well said,¹ "that a cheerful face is a good tonic; but one must laugh little *with* patients and not at all *at* them, for, however ridiculous their fancies may be, they must be reasoned, not laughed, out of them."

On your first interview with a patient, you will do well to hear much and say little, for however much she may be agitated and flurried, she will carefully treasure up any expression of opinion you may incautiously let drop, that subsequent experience of her case may not corroborate nor treatment substantiate.

¹ Dr. Tilt, *Uterine Therapeutics*.

By allowing the patient to tell her own tale in her own way, although some little time will be lost, much will be gained from her method of telling it; and should she become somewhat discursive, the practitioner can readily bring her back to the more immediate symptoms by following up any clue that her narrative may have given him, or elucidating more fully any special points for investigation. Among hospital patients, more especially when we have those voluble Celts to deal with, who habitually complain *de omnibus rebus et quibusdam aliis*, it is often advisable to launch out *in medias res*, and ask boldly, What do you complain of? Our subsequent plan of action being determined by the nature of the complaint; thus, if pain be the principal symptom, its seat, nature, constancy or recurrence, duration, etc.

It is well to avoid putting leading questions, for the answers are often very misleading, the patient either not understanding the query, or thinking it right to say yes or no, depending upon the manner in which the question is asked. A far better plan is to lead up to the point you are anxious to ascertain, without, however, suggesting an inference or allowing the patient to see the drift of your queries.

In young and unmarried patients it is always better to ascertain the general condition of the principal functions before proceeding to the discussion of the uterine symptoms, as the nervous, the circulatory, the digestive, ascertaining the condition of the bowels, and then inquiring as regards the menstrual functions, leucorrhœa, dysmenorrhœa, etc. The duration and frequency of the catamenial periods should always be noted, together with the fact of their being scanty or profuse, painful or natural.

Much may be learned by a careful study of the physiognomy. It is difficult to convey in words the significance of the various shades of chloro-anæmia. It is an experience to be gained only by practice.

The appearance of anæmia from incipient phthisis in the young differs materially from that of chlorosis, and this again from the semi-chlorotic tinge due to hæmatocœle, or the pallor arising from pelvic cellulitis, or the blanched aspect depending upon menorrhagia, or the cachexia from malignant disease of the uterus. And yet the gradations are so slight that it would need a thorough artist to depict them aright. Again, in ovarian tumors the physiognomy is most characteristic. Functional disorders of the ovary stamp their impress on the countenance as well as on the upper lip and other portions of the face not usually hidden by hirsute appendages.

It is only after much experience that the young practitioner will be enabled to estimate at their proper value the so-called subjective symptoms, *i. e.*, what the patient herself tells him; he will frequently find that the objective signs, *i. e.*, the actual physical condition of the parts, are by no means in direct relation the one to the other; in fact, they often vary inversely—the more the complaint the less the cause. Many young women refuse to acknowledge they are ill or suffering until the fact is so patent to their friends that it is useless any longer denying it; bashfulness, and a dislike

to be considered ill, or to adopt the requisite precautions, being their chief motives in maintaining silence. Whereas among older patients they are apt to exaggerate trifling ailments, and make mountains of molehills, partly out of fear and partly to increase our sympathy for their imagined sufferings.

It will be advisable to have some systematic method of taking notes, for by this means important points are less likely to be overlooked, the cases are more uniform for reference, and much needless time and trouble is saved.

A form similar to the one given, modified from Thomas, will be found to contain all that is requisite for ordinary cases, special facts being noted in addition, depending upon the nature of the case.

Name..... Age..... Married?.....
 Date of first visit..... Address.....
 No. of children..... Date of last confinement.....
 No. of miscarriages..... Date of last miscarriage.....
 Age at first menstruation..... Date of last catamenia.....
 How long ill.....
 Principal symptoms.....

Supposed cause.....

Present condition as regards

Menstruation, { Regularity.....
 Amount.....
 Duration.....
 Pain.....

Discharge, . { Character.....
 Amount.....
 Constancy.....

Pain, . . . { Locality.....
 Degree.....
 Character.....

Physical signs.....

Diagnosis.....

Treatment.....

The order of filling in may be varied according to circumstances,

but the several facts indicated should be ascertained before the visit is completed.

An outline diagram, as in Fig. 1, filled in just after the examination, will save much time and convey more at a single glance than mere written descriptions.

The question of the necessity of resorting to an examination, where from the obscurity of the symptoms, or, on the contrary, from their pointing definitely to some local lesion or abnormal condition, is one not always easy to be determined.

It is a point of great importance to decide, for on the one hand we must make every allowance for that female modesty which is

FIG. 1.



Outline Diagram showing Section of Pelvis. (After ROWELL.)

the best attribute of woman and the surest safeguard of society, and not press for an examination until certain simple expedients have been resorted to, and on the other hand our own professional reputation must be considered. Although the symptoms complained of may point to disease of the uterus, ovaries or contiguous parts, yet we must always bear in mind the intimate sympathy in nature between the functions of various organs, menorrhagia, for instance, being a not infrequent symptom in diseases of the heart, liver, and kidneys; and dysmenorrhœa being frequently dependent upon so-called neuralgia, rheumatism, etc. In fact, "It may be affirmed that no severe constitutional disorder can long continue in a woman during the predominance of the ovarian function without entailing disturbance in this function. And the converse is also true, that disorder of the sexual organs cannot long continue without entailing constitutional disorder, or injuriously affecting the condition of other organs." (Barnes.)

The question then is, what symptoms or combination of symp-

toms lead us to infer that some local mischief is present and necessitates an examination?

Menstruation being the most important function, any disturbance of this will probably be the first indication to arrest our attention, such as defect, excess, irregularity, pain, etc. As a rule in ordinary cases of *amenorrhœa*, more especially in those associated with chlorosis, tubercular cachexia, or anæmia from over-work or insufficient supply of nourishment, no local examination is necessary; but should the menstrual molimen recur at regular intervals, and the patient suffer much pain and discomfort, although no discharge of blood appear outwardly, we are justified in resorting to a local examination, as the case may prove to be one of retention of the catamenia from imperforate hymen or os uteri, and if not relieved may prove fatal.

Where *menorrhagia* persists and is not influenced by ordinary remedies, but produces marked anæmia, debility, and impairment of the general health, an examination should always be resorted to even whilst the hæmorrhage continues, more especially if the loss be excessive, for a polypus, fibroid tumor, or cancer may be present.

In cases of *dysmenorrhœa* the question of resorting to examination is often a very perplexing one. After the usual recognized means have been tried, on the supposition of its being neuralgic or congestive, and where the discomfort is so great as to unfit the patient for her ordinary duties, or her general health suffers materially from the frequently recurring paroxysms of pain, an examination with the view of detecting any flexion or obstruction is clearly indicated, and should be resorted to.

In cases of *leucorrhœa* in single women, it is well to try first what influence iron and aloes, with some astringent injection, or sea-bathing, will produce; but should the general health suffer, more especially where there is any phthisical history, and the discharge continue excessive, spite of all our remedies, an examination should be made.

Where patients complain of *bearing down*, dragging pain in the hips and loins, pressure upon the bladder, causing retention of urine or frequency of micturition, and there is no habitual constipation to explain the symptoms, or these persist after the former has been remedied, an examination had better be instituted.

Having learned all that is possible from the patient's statements as to her sufferings and symptoms, and having decided that a local investigation is necessary to complete the diagnosis of the case, the reasons for this should be briefly stated to the patient, and her permission obtained. It is best to leave entirely to the patient as a general rule, the option of her mother or friend being present in the room during the examination. But in the case of young unmarried girls, especially if there is the least tendency to hysteria, it is always a prudent precaution to insist upon the mother or some other discreet married friend being present.

CHAPTER II.

MEANS OF PHYSICAL DIAGNOSIS.

IN order to arrive at a correct diagnosis, it is essential that the student take every opportunity of educating his sense of touch, of acquiring the "tactus eruditus," for upon this sense he will have mainly to rely in a large number of cases. The sense of hearing may assist him in some doubtful cases of abdominal tumors, the sense of sight corroborate an impression that the sense of touch has suggested, or the sense of smell even lead to the suspicion of pregnancy, cancer, or other condition; but it is upon the sense of touch more particularly that he will have to depend for arriving at a correct diagnosis in nearly all instances of uterine and pelvic disorders.

As Gooch has ably remarked: "The faculty of observation requires rather to be guided than to be sharpened; the finger soon gains the faculty of feeling when the mind has acquired the knowledge of what to feel for."

It will be well to enumerate the various means at our disposal, so that the student may see them at a glance.

Methods resorted to for Physical Diagnosis in Uterine Disorders.

1. Vaginal touch.
2. Conjoined manipulation, bimanual palpation, or abdomino-vaginal examination.
3. Uterine exploration, utero-abdominal, -rectal, and -vaginal exploration.
4. Inspection of the vulval outlet, and examination by the speculum.
5. Abdominal inspection, palpation, percussion, and auscultation.
6. Rectal touch, recto-abdominal, -vaginal, -vesical, rectal exploration.
7. Dilatation of cervix uteri by means of tents.
8. The aspirator or exploring needle.
9. Examination of the secretions, discharges, or substances expelled, by the naked eye or assisted by the microscope.
10. Anæsthesia.

Management of Patient during Physical Examination.—Having previously explained to the patient the necessity for resorting to a local investigation, our next object is to place her in such a position as will least offend her sense of modesty, at the same time enable us to examine the condition of the pelvic organs without unnecessary exposure.

In England, the more usual method is to place the patient in the left lateral position, the ordinary obstetric one. This affords perfect facility for digital exploration, for the passage of the sound if

requisite, as also for the employment of the speculum. The body should lie obliquely across the couch or bed, the head being well over to the further side, the hips close to the edge of the couch, the shoulders on the same level as the buttocks, the knees drawn up towards the abdomen. If the left arm be brought out behind and the patient rolled somewhat over, so that the left shoulder rests upon the couch, we have the semi-prone position, which proves very convenient where we have to pass the speculum. A folded shawl or light rug should always be employed to cover over the lower portion of the body, both to prevent the patient getting chilled as well as to avoid unnecessary exposure.

The dress and underclothing must now be pulled gently back towards the buttocks, being disengaged over the knees if the dress be at all tight, so that the examiner is not incommoded in any way.

If the practitioner be ambidexter, *i. e.*, can use either hand equally well, the left lateral position has many advantages. If the right index finger be employed, the sensitive pulp of the digital extremity naturally is directed backwards, so that the posterior vaginal cul-de-sac and the posterior portion of the pelvis can be thoroughly explored, but as the finger-nail is turned toward the cervix uteri, and the examiner must cross his left hand awkwardly over the right to get at the abdomen, it is more difficult to carry out the conjoined manipulation. The perineum in this position can, however, be more fully retracted than when the patient is in the dorsal position. The right side of the pelvis, including the right ovary, is most readily explored by this arrangement.

If the left index finger be employed, the pulp of the finger being directed forward enables us to ascertain readily the condition of the cervix, the anterior wall of the vagina, and anterior portion of the pelvis. The right hand is now conveniently disposed for abdominal palpation. The left portion of the pelvis, including the left ovary, are best explored in this way. Where the left finger is employed, it is essential to place the patient nearly transversely upon the bed or couch, the back being at right angles to the side of the bed, and not parallel with it.

The dorsal position is that usually adopted on the Continent, and has unquestionably many advantages over the lateral one, inasmuch as if the patient be properly placed, the conjoined manipulation is far more readily carried out, the abdominal muscles being relaxed, and the organs occupying the position natural to them at the time of examination, without being deflected to one side or other, as happens when the patient lies on her side.

The right finger now serves equally well to explore both sides of the pelvis, and the left hand is conveniently disposed for abdominal palpation. Should it be found necessary to examine the patient lying on the left-hand side of the bed, who may be too ill to be transferred without unnecessary risk or trouble to the right side of the bed, it will be more convenient to employ the left index finger to examine internally, the right being used for abdominal palpation so as to get the conjoined manipulation. In order to obtain

the full advantage from our examination, the patient should either be undressed and in bed, or should have her clothes loosened, her corset unfastened or removed, and all tight bands round the waist undone. If in bed, a hard, firm mattress should always be preferred to a feather bed. The patient must lie close to the edge, fairly upon her back, her head resting upon a pillow, the knees well drawn up and slightly abducted.

Perpendicular Examination.—This, a common method in some countries, is seldom resorted to here, but nevertheless is often very necessary, as in cases of hernia, displacements of the uterus, whether version, flexion, or prolapse, where we wish to form an accurate idea of the true state of affairs when the patient is in the upright position. No exposure is necessary, and if the object of it be explained to the patient herself, she will seldom offer any objection.

Vaginal Touch.—Having placed the patient in the dorsal or lateral position, loosen any clothes and cover her with a rug or shawl; the examining finger being first lubricated with olive oil, cold cream, vaseline or lard, carbolized oil being most suitable, the remaining fingers are flexed upon the palm and the thumb laid upon them, the forefinger is introduced into the vulva from its posterior aspect along the raphe of the perineum. As soon as the sensitive pulp of the finger detects the vaginal orifice, the finger is pressed firmly but gently against the distensible perineum, and then passed onwards along the posterior vaginal wall, following the curve of the sacrum. By this means the sensitive structures near the pubes are avoided, and the patient thus saved any unnecessary annoyance; besides, it is easier to gain access to the vagina in this way than if the point of the finger be carried more forward.

The several points to be noted in the order in which they would generally present themselves are, incidentally, any hæmorrhoidal excrescences, undue sensitiveness or laceration of the perineum, rigidity of the hymen, hyperæsthesia of the vulval orifice as indicated by spasm, presence of any vascular growth of the urethra, warts, condylomata or sores on the vulva, perviousness and capacity of the vagina, rugosity of its walls; whether unusually dry and sensitive, increased in temperature, or relaxed and bathed with mucopurulent secretion; whether any foreign body be detected, such as a polypus, malignant growth, or some inorganic substance introduced from without; whether the rectum be loaded with fæces, whether any induration or fulness be detected in the posterior vaginal cul-de-sac, such as might result from a retroverted or retroflexed fundus uteri, a fibroid of the posterior wall of the uterus, a prolapsed ovary, a retro-uterine hæmatocele, or remains of pelvic cellulitis. Having made these observations, we now come to the main object, in most cases, of our examination, the cervix uteri. Note the position, direction, density, size, shape, character of surface as to smoothness or roughness, as well as sensitiveness. Then ascertain the state of the os uteri, whether closed or patulous, circular or oval, incomplete from laceration of the cervix, indurated or softened, smooth or granular, or ulcerated as in the advanced

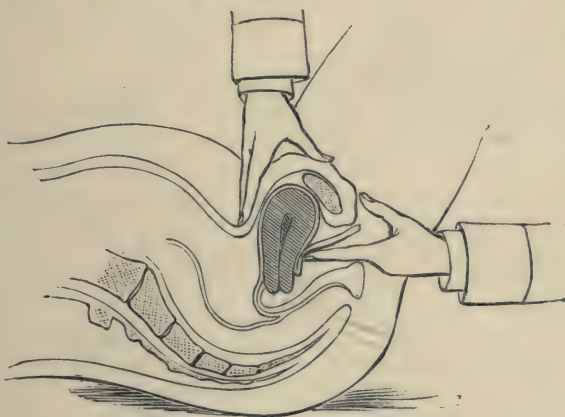
form of epithelioma, presence and character of discharge as to quantity, tenacity, etc.

Thus far the finger alone has been employed, but no examination should ever be considered completed unless abdominal palpation has also been resorted to, the two methods, constituting the conjoined manipulation, being invariably combined.

The passage of the whole hand into the vagina, the patient being anæsthetised, has been practised in certain rare and obscure cases, but should be resorted to with great care lest the vulva be seriously injured or the vagina ruptured.

Conjoined Manipulation or Bimanual Examination is unquestionably the most important method of diagnosis at our disposal, and should in every case be resorted to. It is of the utmost value in determining the position and relation of the pelvic organs to one another, and enables us to estimate correctly the bulk, sensitiveness, mobility, position, and shape of the uterus, etc. In making a vaginal examination with the finger the tendency is to push up still further out of reach the organs we are attempting to explore.

FIG. 2.



Method of Bimanual Examination. (After Sims.)

To overcome this, and even, if necessary, to press the pelvic contents still lower down, the hand should be laid upon the lower portion of the abdomen. The index finger of the other hand being meanwhile in the vagina, the conjoined manipulation being carried on simultaneously enables us to explore seriatim the several pelvic viscera.

The dorsal position of the patient, with the knees drawn up, is the one most suitable for the majority of cases, but the lateral one can be resorted to where any special indication for it is discovered.

It is well to have the clothes loosened, so that the hand may be passed under them directly on the surface of the abdomen, without the intervention of anything likely to interfere with the delicacy of touch. It is not always necessary to uncover the abdomen, but this should invariably be done where any unusual abdominal enlargement can be detected.

If the uterus be normal in size and position, its body can usually be detected in front of the cervix through the upper and anterior wall of the vagina. If the ulnar edge of the left hand be now pressed firmly but gently, first towards the sacral promontory, and then downwards in the axis of the pelvic brim, the right index finger internally will be enabled to appreciate the condition of the uterus as to size, shape, density, mobility, sensitiveness, etc. By this method any increase in size, as in early pregnancy, any irregularity in outline, as in fibroid, any induration of the cervix, as in the early stage of cancer, any impairment of mobility due to cellulitis, hæmatocele, etc., any increased sensitiveness, as in metritis, may readily be detected. In order to accomplish the conjoined manipulation properly, it is essential to have the abdominal walls relaxed. The patient's shoulders should be slightly elevated on a pillow, the knees drawn up, and she should either be engaged in conversation so as to distract her attention, or be encouraged to take several consecutive deep breaths, when the hand can be sunk deeper at the end of each expiration without causing unnecessary discomfort.

Should the patient be extremely nervous, or hysterical, or unduly sensitive, it may be well to produce anæsthesia, more especially if any phantom tumor be detected.

If the abdominal wall be very fat and the intestines very flatulent, or the rectum loaded with feces, it will be expedient to give some brisk aperient, or administer an enema, so as to clear out any accumulation and lessen the distention of the abdomen.

Having satisfied ourselves as to the condition of the uterus, we should then ascertain the state of the ovaries, broad ligament, etc., as to the several points already indicated. The ovaries, when in their normal position, may often be felt, in thin persons, about midway between the fundus uteri and the crest of the ilium. When prolapsed they may more readily be detected if the patient lies on the side. If any tumor be detected in the pelvis, its relation to the uterus should be estimated, or its connection with the ovaries or broad ligament determined, if possible. The means of diagnosing these will be fully discussed further on. Too great caution cannot, however, be exercised in conducting the examination, otherwise in an attempt to arrive at a correct diagnosis, we may succeed in rupturing an extra-uterine cyst or ovarian abscess, or light up fresh inflammatory mischief, supposing the case to have been one of pelvic cellulitis.

Uterine Exploration by means of the Sound.—This should not be resorted to as a mere matter of routine in every case, but only when its employment is necessary to clear up some doubtful point in the diagnosis, or is likely to afford some additional information that cannot be gained by any of the ordinary methods of examination.

Before ever venturing to pass the sound, satisfy yourself, as far as possible, that pregnancy does not exist; ascertain the date of the last catamenia, and estimate by conjoined manipulation the apparent size of the uterus. Should there be the least doubt as to

the existence of pregnancy, avoid using the sound until after another menstrual period has passed by. It is better to wait than to run any risk of inducing abortion, before attempting to clear up the diagnosis. In cases of cancer, acute metritis, pelvic peritonitis, and other similar conditions, the sound should not be used as a rule.

The employment of the uterine sound should be resorted to with great care and gentleness, and only when we are likely to gain some information from its use that we cannot otherwise gain. Several instances have been recorded where the point had been made to perforate the wall of the uterus. This accident is most likely to happen when the organ is in a softened state, such as occurs during the fatty degeneration of sub-involution following abortion or parturition, or in the ulcerative stage of cancer. It has been suggested that the point may have passed along a dilated Fallopian tube, but although this may explain some few cases where the point of the sound has been felt beneath the abdominal wall, there is little doubt but that in the majority of such cases perforation of the uterine wall has actually occurred. Although in most instances no very serious symptoms have followed, the accident must not therefore be regarded as one unattended by risk.

Where the sound is employed to replace a retro-verted or -flexed uterus, too great care cannot be taken to avoid all force, lest adhesions be torn through and peritonitis ensue. The uterine sound or probe should be made of pure silver, or copper, plated, so as to render it sufficiently pliable to be bent to any shape desired, at the same time sufficiently firm to retain its shape while being introduced, and to replace the uterus if required. The terminal extremity should be slightly bulbous, about one-eighth of an inch in diameter, though for cases of stenosis it is desirable to have it smaller even than this. The sound should be slightly curved, as in Fig. 3. On the concavity of the curve, at two and a half inches from its extremity, a slight notch is made to indicate the length of the normal uterus, other similar notches being placed at intervals of an inch, so as to enable us to measure the length of the uterine canal when this is elongated. It is not requisite to have a knob or shoulder on the convexity of the curve to indicate the normal length of the uterus,

FIG. 4.

Portable Uterine
Sound.

FIG. 3.



Uterine Sound.

to enable us to measure the length of the uterine canal when this is elongated. It is not requisite to have a knob or shoulder on the convexity of the curve to indicate the normal length of the uterus,

The notch on the concave side answers this purpose perfectly well, and does not interfere with the flexibility of the sound. Ten inches is the usual length. A convenient form for carrying in the pocket is one which doubles up as in Fig. 4. Having ascertained by digital and conjoined manipulation the apparent direction of the uterus, the sound, properly warmed, so that it may not excite spasm of the cervix by its coldness, and curved so that it may enter readily the uterine cavity, is then held lightly between the thumb and one or two fingers of the left hand. The patient lying obliquely across the couch on her left side, with the hips close over the edge and the knees well drawn up, the index finger of the right hand is introduced into the vagina, as previously directed, and passed up to the cervix uteri. The sound, with its convexity forwards, is then glided along the palmar surface of the right forefinger, and its point guided into the os uteri, the handle of the sound being held well back. As soon as the point has traversed the canal about one inch, supposing the direction be normal, the handle is swept round in a semicircular direction, so as to allow the terminal portion of two and a half inches to rotate on its own axis. The sound, with its concavity now directed forwards, with gentle pressure finds its way into the uterine cavity, the handle being pressed backwards if necessary, to facilitate this. No force need be employed, the sound, like the catheter in the male subject, is allowed to find its own way. This method is the more convenient one, especially in virgins where the vulval orifice is small, the vagina narrow, and the perineum rigid.

Where the vagina is capacious, and the parts more relaxed, the concavity of the sound may be directed forward from the first, the handle being held well forward between the thighs, and gradually carried more backwards as the sound enters the uterine cavity. If preferred by the examiner, the left index finger may be inserted into the vagina, the patient lying transversely across the bed, the sound held lightly in the right hand with the concavity forward, and so passed into the uterus. No force should in any case be employed. If any flexion of the uterus exist, it may be well to increase the curve of the sound until it will pass without difficulty.

Sims recommends his speculum to be first passed, so that the examiner can see to pass the sound, but the disadvantage of this method is that the pressure of the speculum may alter the position of the uterus, and so render the evidence derived from the probe fallacious. In case of flexion, too, we cannot assist the passage of the sound by pressing up the fundus with the finger, as can be done in the other method. In the case of virgins, or patients where the vulval outlet is narrow, the passage of the speculum causes much more inconvenience than that of the sound by the usual method, and if the amount of flexion be great, there is less play for the handle of the sound, and more difficulty in passing it into the uterus. Moreover, we lose a great deal of information imparted by the sense of touch when the sound is passed through the speculum.

The several points ascertained by the introduction of the sound are, 1st, *the length of the uterus*. If any difficulty occur in passing the sound the proper distance, the direction of the point must be altered, and gentle but firm pressure exercised so as to overcome any spasm that may be induced. There is often some little delay in passing the internal os, due it may be to flexion, or more rarely to stenosis. In some cases there is distinct pain or uneasiness. When the point reaches the fundus, which is more sensitive than other parts of the uterus, pain is often experienced.

2. *The direction of the uterus*.—This is often of great importance, as in the case of flexions, thus enabling us to differentiate them from fibroid outgrowths. In some cases where the uterus is embedded in surrounding deposit, as in hæmatocele and pelvic cellulitis, it is essential to determine the exact position of the uterus before resorting to aspiration or puncture.

3. *The mobility of the uterus*.—In many cases we can readily ascertain the extent of mobility of the uterus by the conjoined manipulation, but where an ovarian or other tumor is in close apposition with the uterus it is very important to determine whether the organ be intimately associated with it or independent of it.

4. *The sensitiveness of the uterus*.—If the sound be passed with care into a healthy uterus, little or no inconvenience is produced, but in case of metritis, pain is complained of the moment the point of the sound touches the fundus.

5. *The presence of any foreign body within the uterus*, such as a retained ovum, polypus, or fibroid tumor, can often be ascertained by means of the sound.

Utero-abdominal Exploration.—The employment of the sound, conjoined with abdominal palpation, is often of great service in determining the direction and size of the uterus, where, from the presence of an abdominal tumor, conjoined manipulation fails in detecting the position of the uterus, as also in deciding whether the tumor springs from the uterus, is loosely attached to it, or perfectly independent of it. The patient lying in the left lateral position, the sound being passed in utero, is then held by the left hand, whilst the right hand is employed for external palpation. If the sound be now rotated so as to move the uterus, the external hand will be enabled to detect whether the tumor moves with it, as in the case of a fibro-cystic tumor, or is uninfluenced by the movement, as would probably be the case where an ovarian tumor was present. If any difficulty be experienced in differentiating a fibroid polypus from an inverted fundus uteri, or even a submucous fibroid from a retroflexed fundus, the fact of being able to lift the organ somewhat on the sound so as to feel the fundus distinctly behind the pubes, will clear up any doubt upon the subject.

Utero-rectal Exploration.—This is of service in cases of fibroid or other tumors growing from or connected with the posterior wall of the uterus. The sound being introduced into the uterus, the finger per rectum detects any irregularity of the body or cervix. If a small ovarian tumor be situated in Douglas's pouch, this

method is often of great value in determining the exact nature of the growth.

Utero-vaginal Exploration.—This is really an extension of the ordinary vaginal touch, the sound prolonging our sense of touch into a cavity into which our fingers are unable to reach. The sound being passed in uterum and the finger per vaginam, any irregularities upon the wall of the uterus, alteration of direction or flexion of the uterus, can thus be readily detected.

Inspection of the Vulval Outlet.—The opportunity should always be taken of examining the external parts visually before introducing the speculum, more especially if the finger have previously detected any suspicious irregularities or abnormalities around the vulval outlet, as mentioned under the head of vaginal touch.

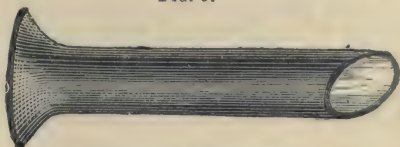
Examination by the Speculum.—It should always be remembered that this is merely a confirmatory test, so to speak, and in fact often resorted to more for the purpose of treatment than diagnosis. The sense of touch should always be first appealed to, and is by far the more important, the sense of sight by means of the speculum, being only called in requisition where we have reason to believe that granular degeneration of the cervix exists, and some application is necessary, or in cases of cancer, etc. The field for observation is limited, the vagina itself and the os and cervix uteri being all that can be seen by means of the speculum. Before examining a patient, we should always take the precaution to place her in such a position on the bed or couch that, in the event of the speculum being needed, a good light is obtainable without further change of position. Direct daylight is always to be preferred, the hips being placed opposite the window. Where this cannot be well managed, an ordinary hand-glass answers the purpose of reflecting the rays of light into the trumpet-shaped end of the speculum which serves to concentrate the rays of light, or a concave mirror similar to a laryngoscopic mirror, with rather a larger central aperture, may be employed. If we are obliged to depend upon artificial light, a short bit of wax candle, an ordinary bull's-eye lantern, or one of Collin's illuminating lamps will answer best.

There are numerous varieties of specula invented; some in the form of cylindrical tubes, others having a valvular arrangement either bivalve or trivalve. Sims's acts more as a retractor upon the posterior vaginal wall. Many of them are very ingenious, but the more elaborate the mechanism the more likely are they to get out of order, and the more difficult to keep clean—a very important consideration.

Fergusson's Tubular Speculum, with its trumpet-shaped entrance for concentrating the rays of light, its reflecting surface and bevelled extremity, which allows the cervix to be readily brought into view, is by far the best tubular speculum invented. It is readily cleansed, is not attacked by acids or other applications, provided care be taken to prevent any excess running down, and being tubular it protects the vagina perfectly from any caustics

that may be intended merely for the os or cervix. They have been made of toughened glass with a view to rendering them less fragile. The speculum consists of a tube of glass, about six inches long, the sizes varying in diameter from about half an inch to two inches. This tube is coated with quicksilver, like an ordinary looking-glass, and then covered by india-rubber or vulcanite, well varnished, to render it impervious to the vaginal secretions. Other tubular specula are made of metal, which have the advantage over the glass ones of not being fragile, but the disadvantages of not reflecting the light so well, and being affected by chemical agents. Some are made of porcelain, but they are fragile, and do not reflect the light at all. Others are made of ivory and wood; these are chiefly serviceable for applying the actual cautery, and are seldom employed for ordinary cases. It is well to have some short Fergusson's specula handy, to suit special cases where the uterus is very low or the vagina very short.

FIG. 5.



Fergusson's Speculum.

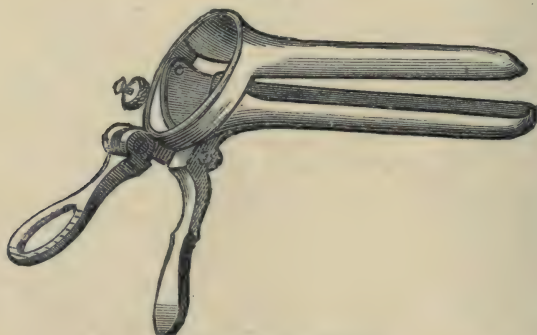
To introduce the ordinary tubular speculum, let the patient lie in the usual obstetric position on her left side, with the hips close to the edge of the bed, the left arm brought out behind her, the body being turned in the semi-prone position. Having first oiled the surface of the speculum, grasp it in the right hand between the thumb and three fingers, the fore-finger being placed on the end to assist in propelling it. Having drawn up the right buttock, and, if necessary, separated the labia, the tip of the speculum is inserted into the vaginal orifice, the perineum being pressed well back by it to avoid injuring the parts in front. The axis of the speculum is then directed backwards, and by glancing through the interior it will be seen when the os is engaged in the orifice, the instrument being pressed slowly and carefully backwards, and if any difficulty arise in finding the os, the speculum should be withdrawn a little and then pressed in again in such a position as the previous examination suggests the cervix will be found in. Where the uterus is much anteverted, difficulty may be experienced in getting the os uteri into the end of the speculum; a sound or other instrument may then be employed to direct the os forwards or pull it downwards, as required. A long, straight tenaculum with a curved hook at the extremity is often useful for the purpose. Should this plan not succeed, it will be well to place the patient in the dorsal position, when the effect of gravity tends to bring the axis of the uterus more nearly into coincidence with that of the vagina, and so facilitates exposure of the os.

If any difficulty be experienced in getting the whole circuit of the os into view, the bevelled end of the speculum should be rotated so as to bring the projecting tip anteriorly, thus pushing up the fundus and bringing the os fully into view.

Cusco's Bivalve Speculum is the most generally useful of all valvu-

lar specula, in that it is easy of introduction, is self-retaining, and brings the uterus nearer to the vulval orifice rather than pushes it away. Having previously ascertained the position of the uterus by digital examination, the speculum, closed, is tilted obliquely sideways so as to avoid pressing upon the soft structures in front of the pubes, and inserted gently within the vaginal orifice, being pressed backwards on the perineum and passed onwards until the extremities are about opposite the os uteri, care being exercised

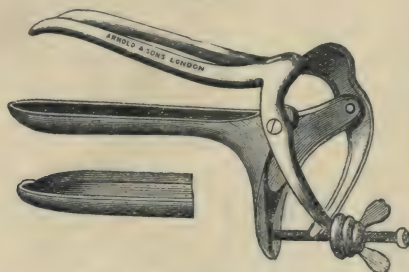
FIG. 6.



Cusco's Bivalve Speculum.

that they do not pass beyond into either cul-de-sac. The blades are then turned antero-posteriorly and opened by means of the handles; as soon as the os uteri is fully in view, the screw is at once turned, and the blades thus fixed. The fundus uteri being pushed up by the anterior blade, the antero-posterior stretching of the vagina tends to draw the cervix downwards and forwards, the

FIG. 7.



Modification of Cusco's Speculum.

axis of the uterus being thus brought nearly in a line with the axis of the vagina.

The lips of the os uteri are also separated, so that the cervical canal can be seen for some little distance.

Care must be taken in withdrawing it not to allow the blades to close completely, lest the vaginal walls be pinched.

Numerous modifications of Cusco's speculum are made, but the practitioner should select the original form, or one in which the

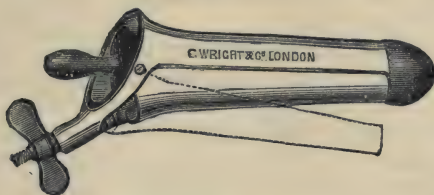
blades are capable of being separated widely, are nearly equal in length (about four and a half inches),* and sufficiently wide to prevent the vaginal walls bulging in (about one and a half inches).

An ingenious modification is an American one (Fig. 7), the upper blade being divided so as to increase still further the breadth when the blades are separated.

If the anterior blade be much shorter than the posterior, it interferes with the mechanism of bringing the uterus into a slightly retroverted position.

Barnes's Speculum (Fig. 8) is a modification of H. Bennet's bivalve

FIG. 8.



Barnes's Speculum.

speculum. The objectionable complication, however, is the wooden plug. The author himself prefers for general use Cusco's.

Sims's Speculum (Fig. 9) is more calculated to prove of service to the operative surgeon than to the ordinary practitioner. It presents

FIG. 9.



Sims's Speculum.

such disadvantages that it is hardly likely to come into anything like general use. It cannot be employed without an assistant, and to be of real value a skilled assistant is necessary. For operative procedures upon the cervix or vagina it is unquestionably of great value, more especially in cases of vesico-vaginal fistulæ, laceration of the cervix, etc.

To employ Sims's speculum to advantage, the patient must be undressed, or have all clothes loosened from the waist, and be placed upon an operating-table opposite a good light, which must be nearly horizontal. She lies in the left semi-prone position, with the head and shoulders low, the left arm behind her, the knees drawn up, the right in front of the left one in contact with the table, the body rotated so that the chest nearly rests upon the

table. The assistant standing behind her raises the right buttock with the left hand, the operator then having determined the position of the cervix and the capacity of the vagina, holds open the vulva with one or two fingers dragging upon the perineum, and then slips the blade of the speculum in, holding it somewhat obliquely, so as to avoid injuring the sensitive tissues in front. As soon as the end has passed the vulva, the blade is rotated so as to bring the back of the instrument against the perineum, which is then retracted, and the end guided into position behind the cervix by the aid of the finger. The instrument is then given in charge of the assistant, who by dragging upon the posterior wall of the vagina converts this latter into a straight canal, and so discloses the cervix to view.

If the patient has been properly placed, so that the vaginal orifice is the highest point of the vagina, this canal becomes distended with air and the pelvic and abdominal viscera gravitate towards the abdomen, so drawing the anterior vaginal wall forward, and the cervix also out of the hollow of the sacrum. When the vagina is narrow, or when it is large and lax, the anterior vaginal wall does not always recede, or bulges up against the speculum, preventing the os being seen. The finger, handle of a sound, or

FIG. 10.



Griffith's Speculum.

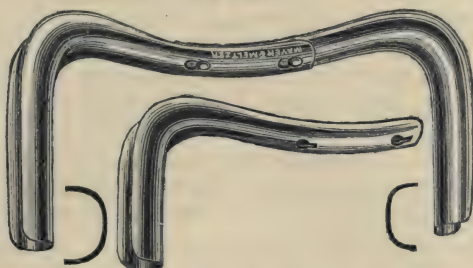
depressor must then be used to hold back the anterior vaginal wall. If the cervix still slants too much backward so as to prevent the os uteri being fully exposed, a small tenaculum or fine hook may be inserted into the anterior lip of the cervix, and this latter drawn forward so as to lie more in the axis of the vagina. But little pain is produced, and the shank of the instrument serves to keep back the vaginal wall as well.

Various modifications of Sims's speculum have been devised with a view to overcoming the tendency for the anterior vaginal wall to bulge in, by means of a depressor or lever frame attached, thus making it really a bivalve speculum, as in Fig. 10. Some of them even have a sacral plate affixed, so that the instrument is self-retaining, and by attaching it to the table acts as a mechanical assistant.

Dr. Heywood Smith's modification of Sims's speculum (Fig. 11) consists of three blades, any two of which can be fixed together by two pins and slots. The duckbill portion is straight and open at

the end, so that the vagina can be plugged with facility without the end of the speculum fouling the plug during withdrawal. Two

FIG. 11.

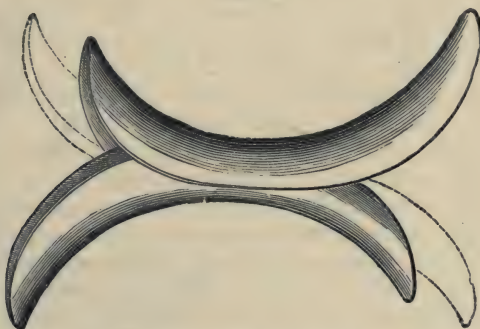


Heywood Smith's Modification of Sims's Speculum.

of the blades can be inserted one after the other, and used as a Neugebauer's speculum.

Neugebauer's Speculum (Fig. 12), as modified by Barnes, and called the crescent speculum, forms a useful instrument in some cases. It consists of two blades, which slide one within the other, and open out when in position. The posterior or larger blade is first passed in a similar manner to Sims's speculum, the patient lying in the left semi-prone position, and guided by means of the right index-finger behind the cervix. The anterior blade is then slid within the edge of the posterior blade, and when the external

FIG. 12.



Neugebauer's Speculum.

ends are brought towards each other the uterine ends diverge like two valves, stretching the roof of the vagina, and giving an excellent view of the vaginal portion. The two blades in combination thus form a bivalve speculum. They may be made so that the handles clasp together in a reversed position to form a Sims's speculum, as in Fig. 11. To withdraw the instrument, each blade is removed separately, the anterior one first.

The instrument is self-retaining, so that the operator has his hands free for making any application that may be necessary. It

is, however, inferior to Cusco's speculum in self-retaining power, and also in enabling us to get the cervix into a line with the vagina.

Abdominal Inspection, Palpation, Percussion, and Auscultation, are of service only in those cases where conjoined manipulation has detected the presence of some tumor rising out of the pelvis or occupying the abdomen. It is not necessary to resort to these methods in every case, as should invariably be done with the bimanual examination.

Inspection.—By this we ascertain the size and shape of the abdomen, regular and symmetrical in case of pregnancy, irregular and unsymmetrical generally in case of fibroids, globular and protuberant in case of ovarian tumor, flat and bulging at the sides in case of ascites. The appearance of the skin as to the presence of any dark abdominal line, enlarged veins, lineæ albicantes, protrusion of the umbilicus, parchmenty or corrugated condition, may prove of service in assisting diagnosis.

As it is essential, for accuracy in description, to know the different regions into which the abdomen is usually divided, the accompanying outline figure will serve to indicate them.

Palpation enables us to estimate the character of an abdominal tumor as to its size, shape, density, solidity or fluidity of its contents, sensitiveness to pressure, mobility, or presence of foetal movements.

Both hands should be employed, the fingers being directed either upwards or downwards, as may seem most convenient to the examiner. The size of the tumor is first determined, any irregularity of its surface, variation in consistence in different parts, mobility from side to side, or from below upwards, sensitiveness, etc., being also noted. If fluid be suspected, the left hand should be laid flat on one side of the tumor, and an impulse communicated to the opposite side by means of a rapid stroke with the second finger of the right hand, or, better still, by placing the index-finger over the middle finger and allowing it to slip suddenly off on to the surface of the abdomen. If fluid be present in any quantity, a distinct wave will be propagated, and communicated to the other hand. To guard against a fallacy occasionally witnessed in cases of fatty tumors, an assistant should place his hand edgewise in the centre, with the fingers directed downwards, between the two hands of the operator. If fluid be present, the wave will be transmitted to the opposite hand as before, but if the tumor be solid, this will not occur.

If the fluid be thick, or contained in small cysts which are very tense, or grasping the tumor with the left hand, and giving a steady but somewhat sudden pressure with one hand, the sensation of outward pressure towards the other hand will be experienced.

If the tumor be solid, on pressing it firmly between the two hands its density will be appreciated.

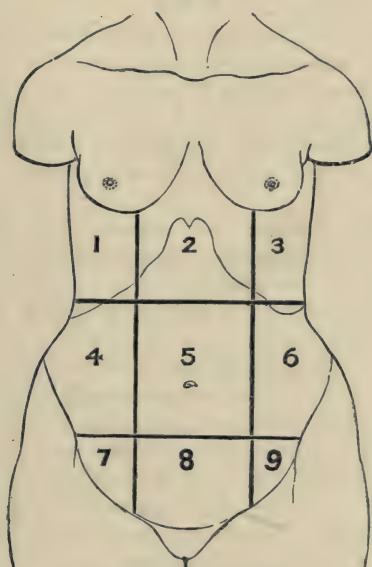
Tympanitic distention of the abdomen may mislead the unwary into suspecting the presence of a tumor, but, apart from percussion,

if the patient's attention be distracted by conversation, the fingers may often be pressed firmly down towards the spine, the sacral promontory even being distinctly felt, thus effectually precluding the possibility of a tumor being present.

This subject will be found more fully entered into in speaking of the differential diagnosis of ovarian tumors.

Percussion should never be neglected in the case of abdominal enlargements. Frequent mistakes are made in diagnosis, owing to inattention to this precaution. A single tap with the finger is often sufficient to dispel a patient's hopes of maternity, and upset the most elaborate diagnosis that had been made without observing this precaution. Percussion is of service in enabling us to differ-

FIG. 13.



REGIONS OF ABDOMEN.

- | | | |
|-------------------------|-----------------|------------------------|
| 1. Right Hypochondriac. | 2. Epigastric. | 3. Left Hypochondriac. |
| 4. Right Lumbar. | 5. Umbilical. | 6. Left Lumbar. |
| 7. Right Inguinal. | 8. Hypogastric. | 9. Left Inguinal. |

entiate flatulent distention from fluid accumulations, in mapping out exactly the size and relation of tumors, in assisting us in diagnosing ovarian tumors from ascitic collections, phantom tumors from real tumors, spurious from real pregnancy, etc. To employ percussion, the middle finger of the left hand is placed firmly upon the abdomen, and the second phalanx struck sharply, distinctly, and evenly with the tip of the middle finger of the right hand. If air be present underneath, a hollow sound is elicited; if fluid, a dull sound is produced; and if the tumor be solid, in addition to the dull note, a sense of solidity and resistance is communicated to the finger. It is always well to get the superficial as well as the deep percussion note, especially if the abdominal walls be very fat.

Auscultation is principally of service in detecting the foetal heart sounds or uterine circulation in cases of pregnancy, the uterine scuffle in fibrous tumors, the borborygmi in phantom tumors, the absence of indication of circulation in ovarian tumors, friction sounds in respiration in these latter, and friction fremitus in case of large hydatid cysts.

In ascites, where the abdomen is considerably distended, and dull on percussion anteriorly and superiorly, owing to a short mesentery holding the intestines down, or to the fact of previous peritonitis having bound down the intestines, auscultation may save us from making a grave error in diagnosis. The mere fact of hearing the air moving in the intestines at a point where, if the case were ovarian, there should be no intestines present, would suggest at once the nature of the case.

In extra-uterine gestation, auscultation is often of great assistance in clearing up the nature of the tumor. A form of stethoscope has been made for auscultating the uterus per vaginam, but is one of those unnecessary refinements more ingenious than practically useful. The ear, with the intervention of a thin linen covering, or the binaural stethoscope, applied to the abdomen, answers every purpose.

Rectal Touch.—This method of examination may be resorted to in the case of virgins where the hymeneal aperture is very small, the hymen intact, or where atresia of the vagina exists. It is, however, generally regarded by the patient as being far more disagreeable than vaginal exploration, and should therefore only be exceptionally employed. In ordinary cases, where the vaginal examination has led to the detection of some unusual condition posteriorly to the uterus, the rectal touch often proves a most valuable method of exploration. The finger cannot only be made to pass much higher, but can explore a greater area of the body of the uterus, sweeping over the posterior wall, as well as getting behind the broad ligaments, feeling the ovaries, and examining the state of Douglas's pouch. Care should be taken to ensure the rectum being empty at the time of examination.

The left lateral position will generally be found the most convenient one for carrying out the rectal touch, but special cases will necessitate the right lateral or dorsal decubitus. Before oiling the finger, it is well to scrape the nail along a piece of soap, so as to fill the interspace between the nail and top of the finger, and thus prevent fecal matter gaining access. Having then coated the index-finger with carbolized oil, it is passed per anum, the patient being instructed to bear down or strain a little as the finger is passing the sphincter, so as to facilitate its entering without unnecessary discomfort. Incidentally, we should notice whether any unusual pain be experienced, indicating the presence of a fissure, ulcer, or, possibly, a fistula, or whether any hæmorrhoidal protuberances, either externally or internally, exist. The finger being passed up along the posterior wall of the rectum, if the uterus be in its normal position, or anteverted, the first prominence encountered will

be the cervix uteri; the fundus being detected if retroversion or flexion exist. On then passing the finger to either side, the ovaries may be felt. The examination is facilitated if the right hand be pressed over the lower portion of the abdomen, so as to depress the uterus somewhat, this constituting the so-called *recto-abdominal* exploration. By this means the bulk, form, position, and sensitiveness of the uterus, as well as of the ovaries, may be estimated. An extra-uterine gestation, uterine fibroid, retro-uterine hæmatocele, induration from pelvic cellulitis, or pelvic abscess, may thus be readily ascertained.

The *recto-vaginal* exploration, or double touch, is often of great service in determining the nature of any swelling in Douglas's pouch. There are several ways of performing this. The index-finger of one hand may be passed per vaginam, and that of the other per rectum; the thumb of the same hand may be passed per rectum; or the index-finger passed into the vagina, and the middle finger of the same hand into the rectum.

Of these several methods the latter is probably the best; the nerve supply of the two fingers being in more intimate relation, and the sensation experienced being more accurately apprehended. Where the two index-fingers are employed, the hands interfere with each other, and the thumb is often too short to be of much service. The better plan is to adopt that method which the examiner finds by experience is most easy to himself, or which is most suitable to the individual case under observation. The thumb may be passed into the vagina, and the index-finger into the rectum, the uterus being pushed down somewhat by the other hand over the abdomen, or drawn down by means of tenaculum forceps applied to the cervix. Where it is desirable to ascertain the connection of retro-uterine swellings with the uterus itself, the uterine sound may be passed into the organ, and the attachment or otherwise of the tumor determined.

Recto-vesical exploration may be accomplished by the uterine or vesical sound passed into the bladder, and the index-finger into the rectum. This method is useful in cases of atresia vaginæ, in determining the presence or absence of the uterus, as also in discriminating between a large polypus and an inverted fundus uteri. The size of the uterus can also be ascertained by this method in cases where the abdominal walls are so fat that we are unable to judge of this in the usual way.

In some exceptional instances it may be deemed requisite to explore by means of the finger passed into the bladder.

Rectal Exploration should never be employed except in very rare cases to establish some very important diagnosis as to the nature and connections of a tumor. Thomas maintains that, except in a very few rare cases, it should be expunged from the list of explorative measures in gynecology, and even then should be employed with the greatest caution, and be regarded in the light of a serious operative procedure. Several fatal cases have been recorded, and permanent incontinence of fæces may result.

To carry out the operation the patient should be anæsthetized, and placed in an exaggerated lithotomy position, the knees being thrown upwards. The hand being held in form of a cone, and well lubricated with oil, the fingers are inserted gradually within the sphincter and by a sort of rotatory movement until the whole hand is cautiously introduced. The fingers are then separated and a careful examination of the pelvic organs is made, a portion of the forearm being passed if requisite. The danger is considerably increased if several examiners succeed each other in exploration.

Dilatation of the Cervix Uteri by means of Tents.—Where the introduction of the sound leads to the belief that there is something within the uterus that needs to be removed, as with polypi, products of conception, granulations, fibroid tumors, etc., or where dilatation of the cervix is determined on with the view to relieve mechanical dysmenorrhœa, the introduction of some agent with this object becomes requisite.

Several have been tried from time to time, such as the dried gentian-root, slippery-elm bark, etc., but the only two that are usually employed now are the sponge tents (Fig. 14) and the *Lami-*

FIG. 14.



A Sponge Tent.

naria digitata or sea-tangle (Fig. 15), both of which may be procured at the instrument-makers. A description of the mode of preparing sponge tents seems therefore uncalled for.

The sponge tent should taper gradually from apex to base, so as

FIG. 15.



A Laminaria Tent.

to present a uniformly conical shape, not bulging in the centre as often made, and the string for its removal should pass completely through the centre from one end to the other, as in Fig. 16, so as to avoid any risk of a portion of the tent being broken off on attempting to withdraw it.

The hollow sea-tangle tents are to be preferred, both on account of the facility of introducing them, and by reason of their swelling more rapidly than occurs with the solid ones. In some instances considerable pain, amounting to almost insupportable agony, is produced during the dilatation of a laminaria tent.

A new form, the tupelo tent, has lately been introduced to notice—the root of the tupelo tree, *Nyssa multiflora*. It is light, smooth,

and its power of absorption is said to be greater than that of sea-tangle. Dr. Thomas thinks that, while it will not entirely supersede sponge, it will in a great many cases replace it.

To introduce an ordinary sponge tent, the patient should be placed in the usual position for examination, and a tubular speculum inserted, for otherwise the sponge becomes softened and swollen

FIG. 16.



A Sponge Tent with thread passing through it. (After THOMAS.)

FIG. 17.



Barnes's Tent-Introducer.

FIG. 18.



Long Sponge-tent Forceps, with slide.

before it reaches the os; and then, having fixed the tent on a pointed stilette, curved similar to a uterine sound, or on Barnes's tent-introducer (Fig. 17), or held by a long pair of forceps (Fig. 18), the point is inserted in the os, the direction of the canal having previously been ascertained by digital examination and the passage of the uterine sound; the tent is then pressed in the direction

indicated, care being taken to insert it completely within the os, otherwise it will probably be expelled before accomplishing the object for which it was introduced; a plug of carbolized cotton-wool soaked in glycerin may then be placed against the os and the speculum withdrawn, the patient being instructed to remain perfectly quiet.

Should any difficulty arise from the uterus being pushed up and receding before the tent, it will be advisable to draw down the anterior lip of the cervix by means of a tenaculum, so as to hold the uterus firmly.

As a rule six hours are sufficiently long to leave a sponge tent in; it should then be withdrawn, and if the cervix be not sufficiently dilated the vagina should be syringed out with some antiseptic fluid and a larger sponge tent introduced, six to eight hours being allowed before being again interfered with. If much pain or inconvenience be caused during the process of dilatation it is always better to give opium, or inject morphia hypodermically, or pass a suppository of opium.

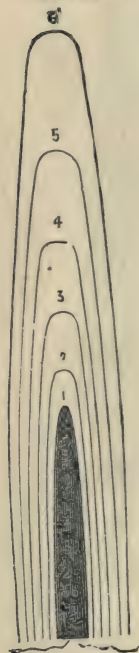
Nausea or vomiting, heats and chills, at times occur. The pulse may increase considerably in frequency, and the temperature run up. In this case it will be better not to persist in the employment of tents, but wait until the irritation set up has subsided.

It is well to steep the sponge in carbolic acid when the tents are prepared, so as to render them antiseptic. An assortment of different sizes, as in Fig. 19, should always be at hand, as it will often be found that a much larger one can be inserted than at first seemed possible. If the one passed be too small, it is apt to slip out before it has had time to expand.

Where laminaria is employed it is seldom requisite to pass a speculum, but having duly softened and bent the sea-weed, insert a pointed stilette in the centre, and let it be passed much as a uterine sound would be. If any difficulty be experienced, a Sims's speculum may be employed if requisite, and a tenaculum used to fix the cervix.

After remaining in twelve hours, attempts may be made to remove it by drawing on the thread attached to the extremity of the tent; should this break, or the removal be found to be impossible, the speculum must be introduced, and the projecting end of the tent seized by the forceps, and so withdrawn. In cases where the tent has been passed completely in utero, the os remaining closed over it so as to prevent the extraction, if the end cannot be seized by a properly constructed pair of forceps, and the os dilated by pulling on the tent, it may be requisite to incise the os slightly, or to insert another tent by the side until the os is sufficiently dilated to allow of its withdrawal.

FIG. 19.



Sponge Tents,
showing different
sizes.

The advantages of using the laminaria in place of sponge tent are thus summed up the late Dr. Nott:

1. Where moderate dilatation is required, the laminaria is preferable to the sponge tent.

2. If placed in warm water, just before the introduction, for a few minutes, they become flexible, coated with mucilage, are easily curved to suit the cervical canal, and may be inserted with the utmost facility.

3. From their smoothness and softness they are removed without force, and produce no abrasion or irritation.

4. They may be medicated with morphia, iodine, or anything soluble in water, but do not absorb alcoholic solutions or glycerin. After being so charged, they may be dried and kept for use an indefinite time.

5. They do not become putrid, and therefore poisonous, as do sponge tents, and may, therefore, be retained twenty-four hours or more with impunity.

6. The laminaria will be found of great benefit in obstructive dysmenorrhœa, if introduced a few days before the menstrual period, and also in cases of uterine catarrh connected with contracted cervix; they prepare the way well, too, for all intra-uterine medication. In either case, if softened in hot water before introduction, they rarely produce any pain or irritation.

7. It is better to insert several small tents than one large one, as the small ones expand more rapidly than the large ones.

The advantage of a sponge tent is that as it dilates it insinuates itself into the folds of the cervical mucous membrane, and thus tends to modify its surface, entangling in its meshes any granulations and causing atrophy of them, or tearing them away when the tent is withdrawn. It is less liable to slip out as it expands, causes less pain, and also serves as a more efficient plug in cases of hæmorrhage than a laminaria tent. The chief disadvantage of sponge is that it becomes very offensive if retained many hours.

The laminaria tent can be made smaller than a sponge tent, and is therefore more readily introduced; it is smoother, and is capable of overcoming greater resistance in expansion than a sponge tent.

Dangers and Precautions.—Much has been written respecting the danger of resorting to this method of investigation, and the practitioner will do well to consider carefully the risks incurred before passing a sponge tent. Several instances have been recorded of death from peritonitis, pelvic cellulitis, tetanus, septicæmia, etc., due entirely to the passage of a tent, and it is very probable that numerous other instances could be cited, were all the fatal cases published. To avoid as far as possible these risks, Dr. Thomas suggests that the following points should be attended to:

1. No force whatever should be employed; either the direction must be altered or a smaller tent made use of if any difficulty occur.

2. The patient should always be seen at her own residence or in

hospital, and she should be confined strictly to bed during the process of dilatation. Never think of inserting a tent and then allowing the patient to go home with instructions to withdraw it in so many hours' time.

3. Never allow a tent to remain in the uterus longer than twenty-four hours; as a rule twelve hours are sufficient, and much safer. Others can then be introduced if the cervix be not sufficiently dilated.

4. Remove the tent whilst the patient is lying on her back, and let the vagina be syringed gently, not forcibly, with a little Condyl's fluid and water, or carbolic acid, or other disinfectant. Should any rigor, pain, or other discomfort ensue, give quinine and opium, and keep the patient perfectly quiet in bed.

5. In any case keep the patient in bed for the first twenty-four hours following the withdrawal of the tent, strictly prohibit any sexual relations, and do not permit her to travel for several days afterwards.

6. When any previous history of pelvic peritonitis or pelvic cellulitis exists, or where the uterus is already in an inflamed condition, never employ a sponge tent unless after previous leeching and other precautions, and not then without explaining the risk in doing so.

The dangers inseparable from the employment of tents to dilate the cervix should deter any but those having special experience in gynecology from resorting to them. A young woman in perfect health, who suffers periodically from dysmenorrhœa, or who fails to conceive within a twelvemonth after her marriage, has a laminaria tent inserted within the cervical canal a few days before her expected period. The tent is only allowed to remain in six or eight hours, and yet peritonitis develops itself and proves fatal within a few days. Such cases are most distressing, not only to the friends but also to the practitioner. Still, there are cases where it is perfectly justifiable to incur the risk, such as where a patient's powers are gradually being exhausted by severe hemorrhage, where septicæmia threatens from retention of a portion of an ovum and other similar cases, where the cervix is not sufficiently patulous to allow of appropriate exploration or treatment. The danger seems to be greater in those cases where a series of tents have been employed to effect progressive dilatation. It is well, therefore, not to use tents more than twice in immediate succession, and to adopt every antiseptic precaution possible, such as syringing the vagina well with carbolized water before inserting a tent, and again on withdrawal, carbolizing the tent, or smearing it with carbolized oil or lard, packing the vagina with a tampon of cotton-wool soaked in carbolized glycerin, and being extremely careful that the examining finger and any instruments employed are thoroughly clean or disinfected. Where serious symptoms occur, the presumption is that septic material becomes absorbed by the lymphatics, the tent producing a lymphangitis or angeioleucitis in the abundant network of uterine lymphatics; the inflammation spreads rapidly along their course

to the peritoneum and pelvic areolar tissue, and peritonitis, cellulitis, or septicæmia results.

Mr. Tait suggests impregnating the sponge tent with oil of cloves; but even with these there is some risk. Complete immunity from danger may, however, be obtained by placing the tent within an elastic capsule. He thinks that surgeons engaged in general surgical practice, involving constant attendance on suppurating surfaces, should never undertake any operations upon the uterus.

Use of Hydrostatic Dilating-Bags.—If the cervix cannot be dilated sufficiently by tents to allow of the requisite exploration, or where the uterus is much enlarged by a tumor projecting into its cavity, a small No. 1 Barnes's bag may be introduced and distended so as to increase the dilatation.

When the cervix is sufficiently dilated to allow of the introduction of the finger, careful exploration should be made to determine the presence of any fungosities, remains of an ovum, polypus, or submucous fibroid.

Mr. Lawson Tait has introduced lately to notice a method for dilating the uterine canal by continuous elastic pressure. The apparatus consists of a waist-belt, with a strap depending from it back and front, on which a series of hooks are sewn in a line close together, to allow of an easy gradation of the pressure employed. The dilators are a series of conical vulcanite plugs, which screw on to a common stem, which is usually quite straight, though in exceptional cases it requires to be bent. In the handle of this stem there are three holes, through which a single elastic thread is passed.

FIG. 20.



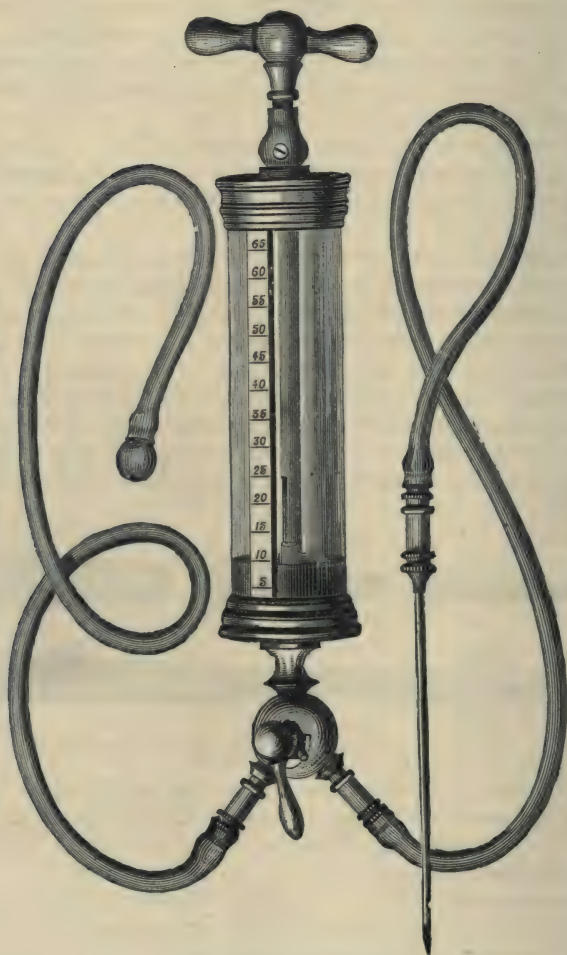
Lawson Tait's Apparatus for Dilating the Uterine Canal.

The point of the dilator is passed into the cervix, and the elastic thread is then fastened to the hooks, so that by very gentle pressure the plug is forced into the cervix. Two rules require to be observed: always to begin with No. 1 dilator, and that sufficient force to give pain should not be used, unless there is imperative necessity for rapid dilatation, in which case opium must be given. The uterus may be completely dilated in four or five hours, but it is better that twenty-four hours should be given to the process.

The Aspirator, or Exploring-Needle.—In cases where the diagnosis is exceedingly difficult or very doubtful, more especially in circumscribed pelvic swellings, the employment of the aspirator proves of great value, often enabling us to clear up the diagnosis, where otherwise it would have been impossible, and also allowing us to treat cases hitherto deemed incurable.

Dieulafoy's aspirator is one of the simplest, most reliable, and useful forms. A very slender, long needle, perforated by a capillary tube, or a fine canula and trocar, is connected by means of india-rubber tubing with a glass cylinder in which a piston plays very accurately. On drawing this upwards and fixing it by slightly rotating the handle, a vacuum is created, powerful suction is thus exerted upon any fluid contained in a cyst penetrated by the needle,

FIG. 20A.



Dieulafoy's Aspirator.

and if it be not too viscid, a portion can thus be withdrawn for examination.

In some cases where no aspirator is at disposal, a small quantity of fluid may be withdrawn by means of an ordinary hypodermic syringe.

The exploring-needle is also employed with the same object, but

is less generally useful, as, apart from the difficulty of penetrating cysts through the vagina, there is more risk of admitting air, and in cases of hæmatocele and pelvic abscess, this is a point of great importance.

The range of use for the aspirator is very great. It has been successfully employed to lessen the tension and permit of the reduction of an otherwise irreducible hernia; to relieve the bladder threatened with rupture by an impassable stricture; to draw off fluid from a distended colon blocked up by extension of malignant disease; to reduce the bulk of the retroverted gravid uterus impacted in the pelvis beneath the sacral promontory; to arrest the development of the ovum in an extra-uterine cyst; to determine the diagnosis between a retro-uterine hæmatocele, an ovarian cyst, and a pelvic abscess; to draw off fluid from a distended abdomen in order that, by chemical and microscopical examination, the question might be determined whether it was ascitic, ovarian, par-ovarian, or due to the irritation of cancer of the ovaries; and to lessen the risk of septicæmia where large quantities of menstrual blood have accumulated from an imperforated hymen, atresia of the vagina, or occluded os uteri.

Before employing the aspirator, some hot carbolized water should first be passed through the apparatus to ensure its cleanliness, and avoid all risk of infection from any foul tube or trocar.

Puncture may either be effected per rectum, per vaginam, or through the abdomen, the position of the swelling mainly determining our choice. Care must be taken not to bend or break the tube by twisting or forcing it too suddenly in.

Examination of Discharges, etc.—This should never be neglected, for it often throws important light upon the nature of the case. Any substances expelled should be carefully examined with the naked eye, and subsequently, if necessary, with the microscope. In cases where hæmorrhage from the uterine cavity persists, and nothing definite can be determined from the character of the discharge, the curette may be employed to bring away a small portion of the mucous membrane, in order to ascertain whether we have merely uterine fungosities to deal with, whether some retained product of conception, sarcoma, or cancer of the fundus, is the cause of the discharge, or whether a portion of sponge tent has become broken off and retained in utero, giving rise to all the symptoms of malignant disease.

The examination, under the microscope, of fluid removed from an accumulation in the abdomen may enable us to distinguish the fluid of an ovarian cyst from that of a par-ovarian cyst, or from that of ascites, fibro-cystic disease of the uterus, or from hydatid cyst. Examination of the scrapings of the surface of suspected growths from the cervix will often enable us to determine the question of its malignancy or not, and consequently the advisability of its removal or otherwise.

Anæsthesia.—In some cases of extreme hyperæsthesia of the vulva, more especially in young unmarried girls, who may be over-sensi-

tive as to the expediency of an examination, but where the symptoms imperatively call for a strict investigation, the administration of some anæsthetic affords the only hope of our being able to make a proper diagnosis. In cases where the examination cannot be properly conducted, either on account of the resistance offered by the patient, because of the pain produced, where delirium is present, or malingering is suspected, anæsthesia may be produced. It should not be resorted to in the consulting-room, and never unless a third person be present. Everything tight round the throat and waist should be loosened, and every precaution taken to avoid any accident occurring from its employment. In cases of spurious pregnancy and phantom tumors, its use cannot well be dispensed with, diagnosis being facilitated, and removal of the supposed tumor being accomplished both at the same time.

CHAPTER III.

MALFORMATIONS OF THE UTERUS.

Absence or Rudimentary Development of the Uterus.—Complete absence of the uterus is exceedingly rare. There will mostly be found, on dissection, one or two small nodules of uterine tissue forming a cavity lined by mucous membrane in the peritoneal fold behind the bladder.

We may suspect this condition where there is only a rudimentary development of the vagina, absence of any menstrual molimen or flow, and where, on passing one finger into the rectum and a sound into the bladder, we fail to detect the presence of any body corresponding to the uterus between the two. In some cases it may be justifiable to pass a finger per urethram, and with a finger of the other hand per rectum, explore carefully the intervening space.

The ovaries may be present although the uterus be absent, so that there may be distinct menstrual molimen but no menstrual flow.

Where the diagnosis can be made out pretty accurately, any attempts at treatment are uncalled for. Should the vagina be also absent, there would be great risk of opening the peritoneal cavity if any attempt were made to form an artificial vagina.

Uterus bipartitus consists of a central closed cord of uterine substance, corresponding to the cervix, inserted into the roof of the vagina, from either side of which at the upper extremity a rudimentary uterine horn proceeds. To each of these a Fallopian tube is attached, running outwards to the ovary.

Uterus duplex occurs when there is complete separation of the two parts of the uterus, each side forming a separate cavity opening below by a separate orifice into a distinct and separate vagina, there being also two external orifices.

Uterus unicornis results when the duct of Müller becomes normally developed on one side, while that on the other is either absent or very imperfectly developed. The uterus thus curves to one side.

Menstruation may be normal, and even pregnancy occur in the developed horn and proceed to a natural termination. Pregnancy is also possible in the undeveloped horn, but this generally ruptures before mid-term, ending fatally.

Uterus bicornis results from development of both ducts, the two uterine halves failing to coalesce completely, but being fixed together at their lower portion. In some cases the point of junction is near the fundus, in others much nearer the os uteri. The cavity of the fundus is divided, the body and neck being single.

Uterus bilocularis occurs when the womb is divided interiorly only by a membranous wall without any external evidence upon

the fundus uteri of any trace of this division. It is spoken of by some authors as *uterus septus*. The vagina may be normal, or divided more or less completely into two separate canals by a continuation of the septum.

Infantile Uterus.—It occasionally happens that the uterus is regularly and naturally formed, but fails to undergo the usual development at puberty, either from some congenital fault, or from mal-nutrition about the period of puberty. This condition is characterized by an extreme length of the neck relatively to the body, the uterus being more cylindrical than pear-shaped. Amenorrhœa is an almost constant symptom.

In the generally ill-developed uterus the whole organ is atrophic. It is often associated with stenosis of the external os uteri and antelexion.

Conception may occur in most of these instances of malformation. In the bipartite uterus the gestation often terminates, as in tubal gestation, by rupture, during the first half of pregnancy.

In the uterus bicornis and bilocularis, repeated gestations may occur interchangeably, sometimes in one, sometimes in the other uterine half, a decidua forming in the non-pregnant half. Pregnancy may also occur simultaneously in both halves; one fœtus is usually, however, arrested in development. Some of the cases of superfœtation may be thus explained, by pregnancy occurring in the two halves at an interval of some months.

The ill-developed condition of the uterus and its small size in these various malformations will account for the frequency of rupture, abortions, and tedious labors.

Treatment.—But little can be done in these cases. We cannot alter the form of the uterus, but may endeavor to augment its development by every means calculated to improve the general health, the administration of chalybeate tonics, the employment of warm hip-baths, hot-water injections, and, where the uterus is sufficiently developed, by electricity, or the insertion of small galvanic stems, as will be found mentioned under Amenorrhœa.

Congenital Atresia Uteri is exceedingly rare. The external os may be impervious, or the whole of the cervix may be involved. This condition not infrequently complicates atresia vaginæ.

Acquired Atresia Uteri is generally limited to some portion of the cervical canal, and is commonly due to cicatrization following upon granulation, ulceration, or laceration of the cervix uteri. Injuries to the cervix from severe labors, whether instrumental or otherwise, causing laceration or subsequent sloughing, are probably the most frequent cause of this form of atresia. It may also result from the application of nitric acid, potassa fusa, nitrate of silver, or the actual cautery to the cervix uteri; amputation of the cervix by the knife, or galvanic écraseur, if proper means are not resorted to to maintain the patency of the canal during cicatrization. Sealing of the os externum or internum by a false membrane occasionally also takes place during pregnancy, so that at the time of parturition no os uteri can be felt. Advancing senile atrophy may

produce a kind of concentric obliteration of the os uteri. In elderly women, too, with prolapsus uteri, who suffer from cervical catarrh, adhesions may ensue between the granulations on opposite sides of the canal, especially when the climacteric has been passed and there is no longer the flow of any secretion to keep the canal patulous. In other cases distinct ulceration of the cervix occurs from the constant attrition of the band or cloth worn to prevent the further descent of the uterus, and cicatrization not infrequently takes place, producing atresia. This is occasionally followed by *hydrometra*, or accumulation of mucous fluid within the uterus, giving rise to much discomfort, producing symptoms similar to those observed in cases of *hæmatometra*, or retained menstrual blood, though seldom to a similar extent.

Closure of the uterus may result from extrinsic causes, as from external pressure of tumors, such as fibroid tumors and cancer in the neck of the uterus; any acute flexion; plugging from clots, polypi, membranes, etc.

The passage of the uterine sound will often enable us to differentiate these conditions from true atresia.

Symptoms of occlusion, or atresia, of the os uteri are seldom present before puberty, and in the acquired condition not until after parturition. They will be found fully mentioned under the head of Imperforate Hymen.

Periodical attacks of uterine colic, with pelvic pain and bearing down, or expulsive efforts, accompanied by an absence of the menstrual flow, will naturally suggest the possibility of retention. If, on examination, we detect occlusion of the os uteri with enlargement of the uterus, and the fact of pregnancy can be excluded, we may be almost certain that the case is one of *hæmatometra*, or retention of the menstrual fluid within the distended uterus.

Diagnosis.—The condition most likely to cause difficulty in forming an opinion is that of pregnancy. Attention to the history of the case, the mammary signs, the softening of the cervix, the enlargement of the uterus corresponding to the length of time the catamenia have been absent, the possibility of pregnancy, and the other symptoms and signs usually met with as characteristics of this condition, will enable us to recognize its presence.

In cases of *hæmatometra*, although the mammæ may be tender or painful, we do not notice the enlargement of the follicles, darkening of the areolæ, and other indications of pregnancy. The size of the distended uterus does not correspond with that of the pregnant uterus. Symptoms of retention may have been present for over twelve months, and yet the uterus may not be larger than the pregnant uterus at the fifth or sixth month.

The condition of the cervix in cases of *hæmatometra* varies considerably from that of pregnancy. It is more taken up into the body of the uterus, not soft and infundibuliform in shape, as in pregnancy.

Treatment of Congenital Atresia of Os Uteri.—Should an imperforate os uteri be detected, even when no symptoms of retention of

menstrual fluid are present, it will be well to make an incision in the centre of the cervix, and take means to prevent it closing again, by the occasional passage of bougies, or by the wearing of a glass or vulcanite intra-uterine stem for some time afterwards.

Where there is distinct evidence of hæmatometra existing, the fluid may be drawn off in small quantities at a time by the aspirator or trocar, with antiseptic precautions, as indicated when speaking of the treatment of imperforate hymen, or a crucial incision may be made at a spot corresponding to what should be the normal os uteri, and the retained fluid allowed to escape freely, warm water being subsequently injected carefully into the uterine cavity, to facilitate expulsion of the treacly fluid, and also to cleanse the cavity of the uterus, so as to prevent decomposition of the fluid remaining adherent to the walls.

The edges of the incision may be touched with the perchloride of iron to prevent their uniting, to check hæmorrhage, and prevent absorption. It will be necessary to take precautions lest the aperture close by cicatrization. The occasional passage of a bougie or sound will often be sufficient. The insertion of any intra-uterine stem is contra-indicated until the uterus has contracted to its normal dimensions, and all the fluid has been expelled.

Acquired occlusion of the os uteri, from injury or other cause, will need operative interference, as in cases of congenital occlusion, modified according to the circumstances of each individual case.

Closure of the cervical canal from extrinsic pressure, as in cases of flexion, fibroid tumors, etc., will have to be remedied by obviating the causal condition. This will be found under the various headings.

Conical Cervix and Stenosis of Os Externum, is not infrequently found as a congenital condition associated with imperfect development of the uterus or ovaries.

The tapering cervix projects further than usual into the vagina, and is often curved forwards, the posterior lips being lengthened and the anterior shortened. There may be stenosis both of the internal as well as the external os, but the latter is generally most marked. The cervical canal itself is fairly normal in size between these two points. The vagina is often smaller than usual, and there may be an infantile form of pelvis, with absence of sexual feeling.

FIG. 21.



Conoidal Cervix.

Symptoms.—Dysmenorrhœa is usually present. The pain, situated chiefly in the sacral and iliac regions, radiates to the loins, down the inner side of the thighs, and at times assumes the character of severe forcing or expulsive pain, unfitting the patient for the

least exertion, and compelling her to keep in bed. Pain is not, however, an invariable symptom. Where the menstrual discharge is scanty, and the mucous membrane becomes completely disin-

tegrated, there may be no evidence of obstruction or pain; but where menorrhagia results, and clots or shreds of decidua attempt to pass, violent spasmodic pain is produced by the contractions of the uterus in endeavoring to overcome the difficulty.

In sensitive patients the agony is often intense, causing vomiting or retching, and even syncope, or extreme prostration bordering on collapse, leaving her exhausted in body and depressed in mind from the amount of physical suffering she has undergone, as well as the ever-present sense of the inevitable return of the pain within a few weeks. The breasts are often extremely painful; the abdomen becomes distended and tympanitic, headache, nausea, and inability to take food, and other sympathetic disorders, all contribute to render the patient's condition most distressing.

Sterility is an almost invariable accompaniment of this stenosis of the os externum, and in some cases is the only symptom that suggests to the patient the necessity of appealing to us for assistance.

Results.—In consequence of the impediment to the free exit of the menstrual secretion, a certain amount of congestion of the uterus ensues, disposing to menorrhagia; this, together with the efforts at expulsion, cause spasm and colic, and lead ultimately to hypertrophy of the uterus.

Endometritis may be produced by the irritation due to retention of the menstrual secretion; ovarian irritation, or inflammation, being often set up, as also pelvic peritonitis. In some instances the Fallopian tubes become dilated, the menstrual fluid, unable to escape freely through the cervix, is forced back through the patulous tubes, and gives rise to pelvic hæmatocele.

In married patients the tendency to these complications is still further increased. Should impregnation by any chance occur, abortion is by no means infrequent, but dysmenorrhœa and sterility are the rule.

Treatment.—Dilatation, whether by tents or instrumental dilators, is generally unsatisfactory; the os contracting again within a very short time. Incision, by means of the metrotome (Fig. 22) or by

FIG. 22.



Simpson's Metrotome.

FIG. 23.



Küchenmeister's Scissors.

a scimitar-shaped knife, or by Küchenmeister's scissors (Fig 23), is a better plan.

It is well to select the week after the menstrual period for the operation. Unless the patient be very nervous, or very sensitive to pain, it is unnecessary to produce anæsthesia. Should the os uteri be so minute as not to admit even the point of the metrotome, it may be well to pass a short tubular, or Sims's speculum, get the os well into view, and incise it by means of a bistoury or knife.

The metrotome may then be passed just up to the internal os, and gradually expanded as it is withdrawn, so as to make the incision triangular in form, the base being at the lower portion, or Küchenmeister's scissors employed, and the vaginal cervix cut through. Where the body of the uterus is nearly in the same axis as the cervix, it is better to make moderate incisions bilaterally; but if the stenosis is associated with ante flexion, it is better to divide the posterior wall only of the cervix freely, so as to lessen the difference, as much as possible, between the axes of the cervix and the fundus uteri.

To restrain hæmorrhage, as also to prevent union by first intention, a dossil of cotton-wool or lint steeped in the perchloride of iron should be passed just within the incisions, the speculum being used for this purpose. A plug or two of cotton-wool, steeped in iodized glycerin, should then be inserted up to the cervix, and the patient kept perfectly quiet in bed for the next few days. The plugs

should be removed the next day, and the vagina syringed out with warm water, to which a little carbolic acid or tincture of iodine may be added. The cotton-wool placed within the incisions may be left until it comes away of its own accord from the syringing. Occasionally secondary hæmorrhage occurs when this happens, and may need a reapplication of the iron to check it.

After the operation care must subsequently be taken not to allow the wound to close up; the occasional introduction of the end of the finger or of a large bougie may be resorted to from time to time with this object, or an india-rubber, glass, vulcanite, or galvanic intra-uterine stem may be inserted, and worn until the next period be due, when it should be removed. Where the incision has been extensive, it is better to keep the patient at rest for the first week or ten days,

vaginal injection being used daily. She should remain in bed during the menstrual period to guard against complications, such as congestive hypertrophy, hæmatocele, menorrhagia, etc. Menstruation generally returns before the parts have become thoroughly healed, while the pelvic vessels are still overcharged, in consequence of the irritation following upon the operation, and as an accompaniment of the reparative process.

Stenosis of the Os Internum.—According to Bennet, the interior

FIG. 24.



The Cavities of the Uterus and Cervix as they are during life. (After BENNET.)

of the uterus does not present, as is generally supposed, a single cavity, reached by a channel or passage through the neck, but a double cavity, one belonging to the body of the uterus, and the other to the neck itself. At the union of the two cavities there is, during life, a natural stricture or coarctation, which closes the cavity of the uterus, and is sufficient to prevent even a small sound penetrating into the uterus unless considerable force be used. The entire cervical canal is physiologically endowed with considerable contractile power, which may be much modified, increased, or diminished by disease.

Barnes, Schroeder, and others regard stenosis of the internal os as so rare as seldom or never to require any operative interference. When obstruction is experienced at the os internum, Barnes finds it almost always to be due to the flattening of the canal at this point, caused by extreme flexion or angulation of the body of the uterus upon the neck. The fact remains, that in many women who suffer from dysmenorrhœa and sterility, the sound passes with difficulty the internal os, and that when incision of this is practised, one or both of these conditions are relieved. The cure of the sterility is not nearly so frequent as the cure of the dysmenorrhœa, but, it must be remembered, impregnation is a far more complicated process than menstruation.

Acquired stenosis of the internal os, or of some portion of the cervical canal, has been known to ensue from the too energetic application of caustics, resulting in cicatricial contraction, from injuries received in parturition, or from some operative interference upon the cervix.

Diagnosis.—Inability to pass an ordinary-sized uterine sound beyond the internal os does not necessarily prove that there is stenosis—there may be merely spasmodic contraction, which will pass off, and allow the sound to enter if gentle pressure be persisted in, or the uterus itself may be acutely flexed, a far more common form of obstruction than stenosis. A metal sound, of about one-fifth inch diameter, gradually tapering at the point to about one-eighth inch, is better adapted to detect any contraction at the internal os than an ordinary uterine sound. If this can be passed readily, and no flexion of the uterus exist, there is no necessity to resort to operative measures.

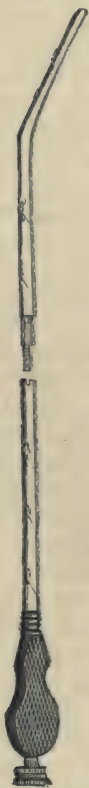
Treatment.—Two distinct methods are available, viz.: (1) *Dilatation* by means of graduated sounds or bougies, sponge or laminaria tents, and by expanding instruments. (2) *Incision*, whether by knife, scissors, or metrotome.

Dilatation.—In some few instances the mere passage of the uterine sound through the cervical canal, a few days before the expected appearance of the catamenia, will serve to materially diminish the spasm and constriction usually produced at such times. But, as a rule, the passage of graduated bougies or metallic rods, commencing with a size that can be passed with little difficulty, will be found requisite. If a No. 4 size be passed and left *in situ* for a few minutes, provided it does not cause much inconvenience, a No. 6

or 8 may then be passed, and retained *in situ* for five or ten minutes. It is well to begin gradually and carefully, and not attempt to accomplish too much at one interview. A convenient plan is to have a series of graduated ends, made of pure copper, electro-plated, so as to bend easily, which fit into one handle, as in Fig. 25. The sizes may range from a No. 4 up to No. 12. A few days afterwards we may commence with a No. 8, and gradually increase the size up to No. 10 or even 12, beyond which it is seldom requisite to go.

The best time to commence this treatment is about a week after

FIG. 25.



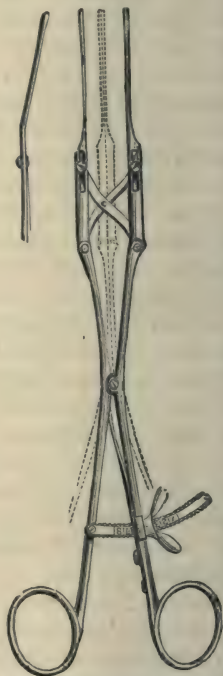
Priestley's Portable Uterine Sound, with movable handle.

FIG. 26.



Priestley's Uterine Dilator.

FIG. 27.



Ellinger's Cervical Dilator.

the period has passed, persevering every few days until the next period is due, when we shall probably find the pain usually attending the process is materially diminished. After this, the occasional passage of a moderate-sized bougie shortly before the expected period will serve to prevent a relapse, though, unfortunately, this method can scarcely be regarded as one of permanent utility, unless, perchance, impregnation ensues, when the difficulty is at an

end. Dilatation by means of laminaria or sponge tents is not a thing to be rashly undertaken. There is always a certain amount of risk attending the process. Many cases of pelvic cellulitis, pelvic peritonitis, or pelvic abscess have been caused by the use of tents, and fatal results have followed, although it seems to be such a simple proceeding.

The dangers attending dilatation of the cervix by means of tents, and the method of employing these latter, have been fully considered when describing their use under the head of Physical Diagnosis.

Dilatation by means of expanding instruments has been tried in many cases successfully. Several ingenious inventions, similar to those employed for rapid dilatation of stricture in the male, have been devised. One of the best is probably Priestley's dilator, Fig. 26. The instrument, when closed, can be passed like an ordinary uterine sound. When in the cervical canal the screw at the end is turned, and dilatation accomplished. The operation is somewhat painful, and as a rule should only be done when the patient is in bed, as it is apt to cause a feeling of faintness. The pain rapidly subsides. There is seldom any hæmorrhage to speak of. In very nervous patients it will be well to give a few whiffs of chloroform before dilating, and to pass a morphia suppository either before or immediately after the operation, the patient remaining in bed until the following day.

A modification of Holt's stricture dilator is also used for rapid dilatation. Ellinger's cervical dilator (Fig. 27) answers the same purpose.

Dr. Pallen,¹ in a *résumé* read before the New York County Medical Society on "Incision and Division of the Cervix Uteri for Dysmenorrhœa and Sterility," says: "I have operated for stenosis of the cervical canal producing obstructive dysmenorrhœa 337 times. The sections have been bilateral for straight canal with stenosis, posterior for anteflexure of the neck at or below the internal os, anterior for retroflexion of the neck, and antero-posterior for anteflexion of the body with retroflexion of the neck, the sigmoid-shaped uterus.

"After a careful estimate of all these years of experience, I am constrained to say that in properly selected cases, where no perimetritis or pelvic cellulitis exists, no procedure offers more certainty of success, more freedom from danger, than does cervical division for obstructive dysmenorrhœa.

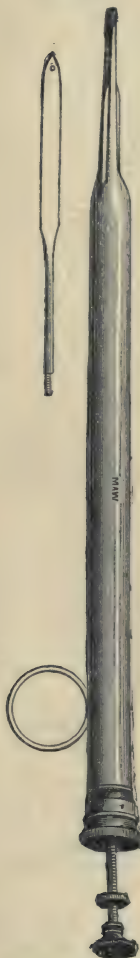
"Of the 337 cases upon which I have operated, more than fifty per cent. have been relieved of their dysmenorrhœa, some thirteen or fourteen have conceived and borne children; about one-fourth of the number were not benefited, from inability to keep open the canal and from other causes unrecognized at the time of the operation.

"Of pelvic cellulitis and perimetritis, I have encountered three cases; of eversion of the lips (ectropion of the os) only one case;

¹ American Journal of Obstetrics, vol. x, 1877, p. 385.

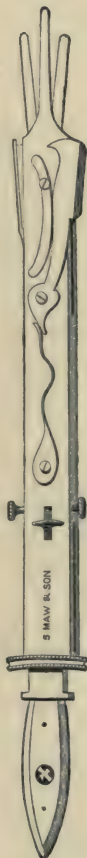
of serious hæmorrhage, either primary or secondary, not one. In the same period of time (twelve years), that these 337 incision operations were made, some 150 patients have been subjected to treatment by tents (of sponge or laminaria), for various conditions, of which two succumbed rapidly from metro-peritonitis, fourteen had pelvic cellulitis, and one had metritis followed by abscess of the

FIG. 28.



Peaslee's Metrotome.

FIG. 29.



Greenhalgh's Metrotome.

FIG. 30.



Civiale's Urethrotome.

posterior wall, which discharged through the rectum. In comparing the results of these cases of dilatation by cutting with dilatation by tents, the deductions are very unfavorable to tenting. If the choice is presented, all conditions being equal, there is no hesitancy between incision and dilatation; the question of pain is in favor of the cutting, and there is very much less danger than from

sponge or laminaria tents. The operation is to be performed upon no case where any cellulitis exists, nor upon cervixes of women laboring under incurable affections of heart, lungs, liver, or kidneys, not in surgical wards of large hospitals, nor by a surgeon who has been in attendance upon erysipelatous, diphtheritic, scarlatinous, or puerperal diseases."

Dr. Barnes also states, "We may then conclude that the use of tents to dilate the cervix uteri is not efficient, and does not possess the advantage of being safer than incision."

Incision of the cervix in place of dilatation by the means enumerated, may be accomplished in various ways.

Incision through the internal os uteri is attended by considerable risk, as the blood-vessels enter the cervix just about this level, and the venous canals are maintained as more or less rigid tubes. Hence the danger of hæmorrhage, as well as of inflammation and septicæmia. Where obstruction to the patency of the cervical canal exists at this point, it is almost invariably due to flexion, and if this be overcome the obstruction will at the same time be removed.

Where it is desired to divide the structures through the internal os uteri, Simpson's single-bladed metrotome (Fig. 22) may be employed, or Peaslee's (Fig. 28). Numerous double metrotomes have been invented, but their action is too mechanical, and too little under control of sight and touch, for them to be resorted to with safety. If any obliquity of the uterus, or variation in thickness or density of the two sides of the cervix exist, an opening may readily be made into the peritoneal cavity. Greenhalgh's (Fig. 29) is one of the most ingenious of these, but it will readily be seen how soon an accident might occur with it. In some instances where severe pain is experienced on passing the uterine sound through the internal os, the mere nicking of this with an instrument like Civiale's urethrotome (Fig. 30), and the passage of a large bougie or dilator, often proves of much service in allaying the pain and facilitating further treatment.

Whatever form of incision be adopted, the success of the operation depends upon the after-treatment. The patient must be kept quiet in bed for several days to avoid risk of hæmorrhage. Should this be troublesome, it is well to expose the cervix through the speculum, clear away all clots, seize one lip with a tenaculum-hook, so as to steady the cervix, and at the same time render the os patulous, then insert a small strip of lint soaked in liq. ferri perchl. or tinct. iodi into the incision; packing the cul-de-sac of the vagina with tampons of cotton-wool, soaked in glycerin or carbolized oil.

If no hæmorrhage ensue after the operation, a glass or galvanic stem may be inserted on the following day, and allowed to remain in for several weeks. Barnes's galvanic coil pessary has the advantage of stimulating development, and being flexible is less likely to injure the uterus than a rigid stem. As long as this is retained, the patient must be carefully watched and instructed to avoid all risk of cold or over-fatigue, more especially at the menstrual epochs, lest peritonitis or cellulitis be set up.

It will be necessary to wear the stem for several weeks to avoid contraction of the cervical canal. It is well to warn the patient that immunity from pain does not always follow the operation, or not for some little time, lest disappointment be expressed at the result. It often happens that before a patient will submit to operative treatment, the general health has been allowed to become considerably impaired, and the tone of the nervous system very much lowered; this will necessitate time, and appropriate constitutional treatment. It is comparatively rarely that entire failure results if only the cases for operation are judiciously selected, and too much time has not elapsed since the commencement of the symptoms. Dr. Barnes has pointed out that success is in proportion to the earliness of treatment. The important point is to operate before secondary changes in the uterus and ovaries have been established.

CHAPTER IV.

DISPLACEMENTS OF THE UTERUS.—ASCENT AND DESCENT OF THE UTERUS.

THE uterus naturally possesses a considerable amount of mobility; still, there are limits to this, and when these are exceeded, either from sudden or repeated or continuous application of undue force, we get displacement of the organ.

Considerable difference of opinion still exists as to the frequency and importance, and even the reality, of displacements. No subject probably has given rise to keener controversy, some contending that displacements of the uterus are due to chronic hyperæmia, inflammation, or hyperplasia; others that these conditions depend upon the displacements. The question is one of great practical importance to determine, as upon an intelligent appreciation of the subject will depend our mode of treatment, which is the all-important consideration for the patient.

Fortunately, we can often solve the question practically, for even if the displacement in the first instance be the consequence of hyperæmia or inflammation, it unquestionably tends to keep up or increase the condition which first caused it; therefore, if marked prolapse or retroversion of a congested or inflamed uterus occur, we are perfectly justified in inserting a pessary, provided it is tolerated and does not increase the discomfort already existing, at the same time that we adopt measures to lessen the congestion or inflammation.

Where, however, the displacement is slight, and the congestion or inflammation marked, we should first endeavor to relieve this by appropriate treatment, before resorting to any mechanical appliances that might tend to increase the congestion, even though they obviated the displacement. This especially applies to the treatment of antelexions by the insertion of intra-uterine stems.

Where the uterus is displaced and fixed by inflammatory adhesions or deposits, no attempt at replacement or introduction of a pessary, as a rule, should be thought of until the inflammatory mischief has subsided, and the uterus again become mobile.

Normal Position of Uterus.—The healthy unimpregnated uterus is suspended about midway in the pelvic cavity (see Fig. 31). A line drawn from the upper margin of the symphysis pubis to the lumbo-sacral articulation just touches the fundus uteri, another line drawn from the lower margin of the symphysis to the articulation between the fourth and fifth sacral vertebræ passing over the lower portion of the cervix.

The uterus is suspended or held in position partly by its relation

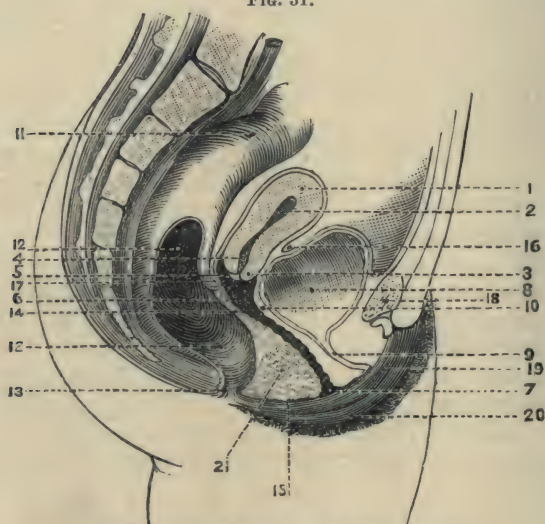
to the contiguous organs—the rectum and bladder—its attachment to the vagina and Fallopian tubes, but chiefly by the folds of peritoneum inclosing muscular tissue constituting the ligaments of the uterus.

The Broad Ligaments extend from the borders of the uterus to the sides of the pelvis, forming a kind of septum which divides the pelvis into two parts, allowing the uterus to move freely backwards or forwards in accordance with the varying distention of the bladder or rectum.

The Round Ligaments are really continuations of uterine muscular tissue, and are enclosed within the folds of the peritoneum constituting the broad ligaments.

The Utero-sacral Ligaments extend from the lower part of the

FIG. 31.



LONGITUDINAL SECTION OF PELVIC ORGANS.

1. Body of Uterus; 2. Its Cavity; 3. Vaginal Portion of Cervix; 4. Canal of Cervix; 5. Os Uteri Externum; 6. The Vagina; 7. Orifice of Vagina; 8. Interior of Bladder; 9. Urethra; 10. Vesico-vaginal Septum; 11. Rectum; 12. Its Cavity; 13. Anus; 14. Recto-vaginal Septum; 15. Perineum; 16. Vesico-uterine Fossa of Peritoneum; 17. Recto-vaginal or Douglas's Fossa of Peritoneum; 18. Os pubis; 19. Labium Minus; 20. Labium Majus; 21. Perineal Body.

body of the uterus to the outer sides of the sacrum, their inner concave borders passing on to the sides of the rectum. They serve to attach the uterus posteriorly, preventing it being driven forwards on the bladder or downwards towards the vulva.

The Utero-vesical Ligaments consist of two lateral folds of peritoneum running off from the posterior portion of the bladder containing bundles of fibrous tissue, and join the uterus just at the junction of the body with the cervix.

The uterus possesses naturally a considerable range and variety of motion, its position being influenced by the ever-varying distention of the bladder or rectum, the fact of standing or sitting, coughing or straining.

The fundus is more mobile than the cervical portion, and is influenced in position by the superincumbent weight of the intestines, being generally kept in a state of slight anteversion, the axis of the uterus being coincident with that of the pelvic brim.

Besides the forward, backward, and lateral movements of the uterus, the organ may also be moved in an upward or downward direction, or become bent upon its own axis, giving rise to flexion.

We have thus ascent, descent, or prolapsus, anteversion and flexion, retroversion and flexion, lateroversion and flexion, inversion.

Causation of Displacements in general.—Any influence which tends to increase the bulk and weight of the uterus, to weaken its supports, or to push or drag it out of its natural position, will cause displacement.

Increase of bulk and weight may be due to congestion, pregnancy, fibroid tumors, subinvolution, hyperplasia or hypertrophy of the cervix.

Weakening of the uterine supports may arise from defective nutrition, not only of the tissues locally, but from the general health being enfeebled.

Pregnancy and parturition exert a most important influence in the production of uterine displacements. During pregnancy the various ligaments become considerably stretched. After parturition they remain relaxed for many weeks before regaining their proper tone. The vagina also, from the excessive amount of distention it has undergone, becomes weakened, not only from its own relaxation, but also frequently from rupture of the perineum. When, in addition to these, the patient gets about too early, or sustains any prolonged exertion shortly after delivery, before the uterus has had time to undergo the process of involution, the natural result of the increased weight of the organ, combined with the weakened and relaxed condition of its supports, is to produce serious displacement, generally in the form of prolapsus, or retroversion, or both conjoined.

The influences tending to push the uterus out of place are tight-lacing, the suspension of heavy skirts from the waist, distention of the bladder, abdominal tumors, prolonged exertion in the erect position—as noticed chiefly in laundresses, milkwomen, and those who carry heavy burdens on their heads, repeated efforts, as in chronic cough, or straining in habitual constipation. Any inflammatory deposits in the pelvis, as noticed in pelvic cellulitis and peritonitis, tend either to push the uterus out of place or, by the contraction of adhesions, to drag it from its normal position.

Ascent of the Uterus.

This does not occur as an original condition. In pregnancy, about the fourth month, the uterus commences to leave the pelvis, rising into the abdomen on account of its increased volume. Fibroid or fibro-cystic tumor of the uterus may likewise occasion a similar ascent.

An ovarian tumor may drag the uterus upwards, or it may be pushed up by pelvic tumors or collections of effused matter, as seen in cases of hæmatocele, pelvic abscess, or even ovarian tumors impacted in the pelvis. The ascent of the uterus is, however, only an evidence of some other primary condition, and does not call for treatment on account of the upward displacement simply.

As the uterus is drawn upwards the vagina becomes elongated or stretched, and the rugæ smoothed out or obliterated. The cervix also becomes elongated and attenuated, and has been known to be actually separated from the body of the uterus.

Descent or Prolapse of the Uterus.

Descent or settling down of the uterus varies in degree. For practical purposes it will be sufficient to describe three stages: the

FIG. 32.

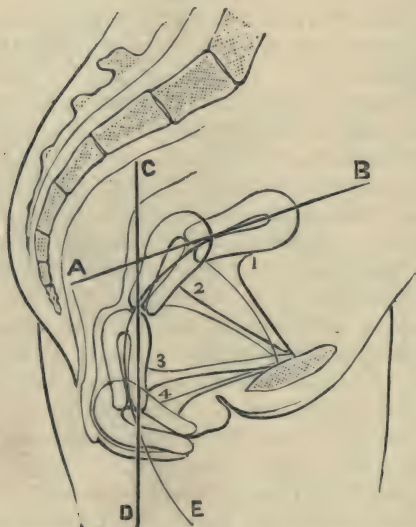


Diagram illustrating successive stages of Prolapsus of Uterus, and the attendant degrees of Retroversion (after BARNES). A, B. Axis of Brim of Pelvis; C, D. Axis of Outlet; B, E Curve of Carus, or Curvilinear Axis of Pelvis. 1, 2, 3. Stages of Prolapsus; 4. Procidentia. The Uterus, tethered to the Symphysis, revolves round it in descent.

(It would probably be more correct to regard 1 as the normal position of the uterus, and 2, 3, and 4 as the three stages of prolapse.)

first, in which the uterus remains entirely within the vulva; the second, in which it passes partially outside; the third, in which the whole uterus is extruded.

The first two stages are usually spoken of as incomplete prolapsus, or falling of the womb; the third as procidentia, or complete extrusion of the womb.

In its descent the uterus follows the curved axis of the pelvis, the fundus becoming more and more retroverted the lower it descends, the cervix following the course of the vagina, until at length it passes out of the vulval orifice.

Prolapsus uteri is an affection to which women, especially in the lower classes, are exceedingly liable, occasioning much inconvenience and distress, interfering not only with comfort but with health and usefulness. The close connection and intimate attachment of the uterus with the bladder and anterior vaginal wall necessarily involves the displacement of these when the uterus is prolapsed, so that in speaking of prolapse of the uterus, prolapse of the vagina with cystocele, or prolapse of the posterior wall of the bladder, must be regarded as an associated condition.

Hypertrophic elongation of the cervix may occur in consequence of prolapse, or may arise independently, and ultimately lead to prolapse of the body of the uterus. In these cases the cervix is elongated out of all proportion to its breadth, and is often markedly attenuated in structure.

Causation.—The predisposing causes are child-bearing, laborious occupations, habitual constipation, and advanced age.

The exciting causes are, as we have already seen, any condition tending to increase the weight of the uterus, to weaken its supports, to force the uterus downwards by excessive intra-abdominal pressure, or to drag it down by traction from below.

In a large majority of instances, parturition is the starting-point. The bulky, subinvolted uterus dragging upon the already relaxed and weakened supports, becomes partially prolapsed. Hyperæmia of the organ is a natural consequence. This may run on to inflammation; in any case, the increased weight causes still further prolapsus with retroversion. Hypertrophy or hyperplasia of the uterus often ensues, and thus we have every condition requisite for permanent displacement of the uterus downwards.

It will be well for the practitioner to bear in mind the several steps thus indicated, as many cases of prolapsus may readily be prevented, and many more arrested, by resorting to appropriate treatment in the early and most curable stages of the malady. We have here a combination of the two most important factors in the production of displacements—increased weight of the uterus, and weakening of the supports which ordinarily keep it in position. Not only is the vagina relaxed and feeble from its recent distention, but the perineum is often ruptured and the uterine ligaments very much stretched. It is little to be wondered at that the frequency of prolapsus is generally in a direct ratio to the number of pregnancies.

Prolapsus does occur in women who have never borne children, but comparatively rarely. In these cases there is often a history of prolonged leucorrhœa, chronic cough, or constipation.

An abnormally capacious pelvis, with alteration of the ordinary spinal curve, the weight of the superincumbent intestines falling directly on the axis of the pelvic brim, in place of as usual upon the posterior surface of the symphysis pubis, unquestionably favors a tendency to prolapsus. Where, in addition to these conditions, the patients have to stand for many consecutive hours, or to carry heavy burdens, or to sustain prolonged muscular efforts, prolapsus uteri is not infrequent.

Prolapsus from senile atrophy results not only from the relaxed state of the vagina, but also from the absorption of the padding of fat that usually is found in the pelvis, as well as in the omentum and abdominal walls. The retentive power of the abdomen is thus weakened.

Owing to the general decrepitude of old age, or the muscular debility from disease and old age combined, the figure alters in shape. The spine, in place of being more or less sigmoid in form, becomes semicircular, the shoulders pressing forward, thus bringing the axis of the pelvis more in a line with the axis of the trunk. The intestines thus descend more into the pelvis, pressing upon the uterus, in place of, as normally, striking upon the posterior surface of the pubes. The uterus is no longer sheltered under the promontory of the sacrum. The vaginal walls being very relaxed, become prolapsed, and exert traction upon the uterus, which does not descend in consequence of its bulk, being often atrophied, and lighter even than when it retained its proper place.

Symptoms.—These chiefly consist of a sense of dragging or bearing down, aggravated on standing, walking, coughing, or straining. The uterus, increased in bulk, drags upon the utero-sacral and broad ligaments, stretching and elongating these, giving rise to dragging pain in the back and lower abdomen. There is usually increased tendency to still further prolapse, when the patient has to strain in emptying the bladder or rectum, the uterus acting as a foreign body by exciting reflex irritation.

There is generally marked prolapse of the anterior vaginal wall with the base of the bladder, constituting cystocele, giving rise to difficulty and frequency of micturition, often attended by tenesmus, and not infrequently cystitis ensues from decomposition of the urine retained in the pouch.

The patient experiences a sensation of weakness in the parts, with inability to stand for long at a time, or to undergo any prolonged exertion. She suffers from considerable fatigue on walking, and feels quite unable to lift or carry ordinary weights.

Although leucorrhœa is generally present to a greater or less extent, menstruation is not invariably interfered with; still, where the uterus is much congested, menorrhagia is not infrequent.

Physical Signs.—If the symptoms point to prolapsus, but the displacement is only slight, it is better to examine the patient standing, first explaining to her the necessity of resorting to this somewhat unusual method of investigation. The cervix will then be found lower down in the pelvis than normal, and on coughing the uterus will be felt to descend still more. Anteversion or flexion is not infrequently present at this stage.

In prolapse of the second degree the os uteri will be found presenting at the vaginal orifice, the fundus being retroverted, the anterior vaginal wall often bulging externally.

In the third degree, the uterus is found to be completely extruded beyond the vulval aperture, the fundus retroverted. The finger per rectum can be passed beyond the fundus, or this latter

may even be distinguished externally lying in the inverted vagina. A certain amount of cystocele and rectocele are usually present. The uterine sound in these cases passes directly backwards and downwards, generally in excess of the normal length.

Differentiation.—If only ordinary intelligence and care be exercised, it is difficult to mistake a case of prolapsus uteri. The conditions most liable to lead to error are inversion of the uterus, fibroid polypus, and hypertrophic elongation of the cervix.

From inversion, prolapsus may be distinguished by the cervix with the central os being felt or seen, and by the absence of any symptoms or history of inversion.

From polypus, by the shape of the protruding mass and the detection of the os uteri in the centre, together with the absence of symptoms of polypus.

Hypertrophic elongation of the cervix is at once recognized by the length of the cervix, the uterine sound often passing in several inches beyond the normal standard, even after the cervix has been pushed up as far as it will go without using violence. It is impossible, however, to replace the elongated cervix, as can be done in cases of prolapsus.

Consequences.—When prolapsus is marked, or of long standing, even if only to the second degree, the uterus becomes congested, its tissues softened and relaxed. Inflammation, either of a chronic form from the persistent congestion and exposure to cold, or of an acute character from violence or injury from the employment of ill-adjusted pessaries, is not infrequent. Hyperplasia or hypertrophy of the organ naturally results, the cervix being specially liable to hypertrophic elongation.

As the uterus increases in bulk and weight, it becomes more and more prolapsed, until in due course it becomes extruded through the vulva, inverting the vagina, which in time changes its character and appearance from that of a moist mucous membrane to that of smooth, dry epidermis. This is often ulcerated in patches from the effects of exposure or friction, though ulceration is not infrequent in the posterior fold of the vagina, where the effects of friction are less obvious, which is frequently overlooked. A kind of scab forms on these ulcerated patches, giving rise to hæmorrhage should the scab by any means become detached.

The rugæ of the vagina generally disappear where the case is one of long standing. The cervix uteri becomes obliterated from the stretching of the vagina, which also causes eversion or ectropion of the cervix, the os uteri being pulled open, the cervical canal being rolled out as it were, so that the os internum takes the place of the os externum, which has disappeared by expansion.

Prolapse of the posterior vaginal wall, dragging with it the anterior wall of the rectum, constituting rectocele, which is often present in the early stages, increases as the uterus becomes extended, the whole of Douglas's pouch descending externally, often containing one or both ovaries, and in rare cases coils of small intestine. After prolonged exertion in the upright posture, gan-

grene has been known to occur from the mass becoming strangulated at the vulva, leading to extensive and even fatal sloughing. Rupture or laceration of the vagina may take place from forcible attempts to return the procident uterus. Occlusion of the cervical canal, after the menopause, has also been observed in some cases.

Hydronephrosis, with dilatation of the ureters and enlargement of the bladder, may result from the displacement of the base of the bladder.

Sudden or acute Prolapsus Uteri may occur from any violent muscular efforts, even in nulliparæ. It has been observed in cases of epilepsy, severe fits of coughing, forcible straining at stool, attempting to lift heavy weights, and other similar conditions. Where the uterus is enlarged by subinvolution, or pregnancy in the early stage, or from the presence of fibroid tumors or polypus, or from hyperplasia, especially if the vagina be lax, and the uterine supports weakened from previous stretching, sudden prolapsus is still more liable to occur.

The patient feels that something has given way within her. There is generally more or less shock, with severe pain over the abdomen, tenesmus, or bearing down, with irritation of the bladder and rectum. Peritonitis is very apt to occur in consequence.

Treatment.—Our first effort will naturally be to replace the uterus in its normal position, our next to keep it there.

Methods of replacing the Uterus.—Where prolapsus exists only in the first or second degree, there is seldom much difficulty experienced in accomplishing the reduction. Resorting to the semi-prone or genu-pectoral position, and allowing the air to gain access to the vagina, so as to gain the advantage of atmospheric pressure, will often be sufficient. Gentle, but steady pressure upwards, by means of one or two fingers passed per vaginam, may be resorted to if requisite. It is always well to secure a thorough evacuation of the bowel and also of the bladder beforehand.

Where prolapsus of the third degree, or procidentia, exists, the protruding mass must first be well lubricated with oil. It is then grasped firmly in the hand, compressing it if necessary, for a short time, so as to reduce its bulk, and then pressed gently and steadily upwards in the direction first of the pelvic outlet, then in that of the cavity, endeavoring to return first the upper portion which was the last to be prolapsed.

If any difficulty be experienced, further efforts should be desisted from at present; the patient being kept at rest in bed for a day or two and enjoined to resort frequently to the genu-pectoral position; a perineal bandage being employed to keep up gentle pressure, and cooling evaporating lotions being used, so as to lessen the congestion and reduce the bulk.

Pressure by means of strapping or elastic bandages has been suggested, but it is seldom that it will be requisite to resort to this expedient.

After a few days the mass will be found to have diminished considerably in bulk, and can then be readily returned.

No excessive force should ever be attempted, as laceration or rupture of the vagina might occur and prove fatal. Where much difficulty is experienced in completing the reduction, it will generally be found that, owing to the length of time the prolapsus has existed, considerable hypertrophy of the uterus has taken place, or there may be adhesions in the pelvis from previous inflammation which tend to fix the uterus more or less in its abnormal position.

In long-standing and difficult cases reduction will be accomplished with much greater safety and certainty by steady, gentle, continuous pressure than by any sudden or forcible attempts. Occasionally it happens that the mass, for the time being, is irreducible. In this case we must desist from making any further efforts at reduction, and content ourselves with suggesting a suspensory bandage which will have the effect of supporting the mass, preventing further displacement, and by exercising steady, gradual pressure tend to reduce not only the bulk but also the prolapsus itself.

Ulcerations of the surface of the procident mass need not deter us from attempting reduction; they will heal far sooner after replacement, when the vagina has recovered its natural moist condition, and the circulation can take place more naturally, provided attention be given to cleanliness, and an astringent lotion be employed, than if we allow the procident mass to remain externally and attempt to heal the ulcerations by local applications of caustics or other agents.

Methods of Sustaining the Uterus.—Having reduced the displacement of the uterus, we should not be in too great a hurry to apply a pessary. For the first few days at least, the patient should be kept quiet in bed, the bowels carefully regulated, the bladder emptied regularly every six or eight hours, an astringent vaginal injection used twice daily, the hips should be elevated, either by means of a pillow when the patient is lying in the dorsal position, or better still by resorting frequently to the semi-prone or genupectoral position.

Any complications that exist, such as hyperæmia, inflammation, hypertrophy, or ulceration, must be attended to. In every case we should endeavor to ascertain, as far as possible, the cause of the prolapse and obviate this, trusting to the secondary results disappearing when the primary cause has been removed.

In almost all instances of prolapsus before the menopause, the uterus is increased in bulk. This we must attempt to remedy. The mere fact of keeping the uterus in its normal position tends to diminish this condition by allowing the circulation to go on naturally. When prolapse exists, the venous circulation is considerably interfered with, the vessels become bent at a more or less acute angle, varicose, and often unduly distended; serous infiltration of the tissues ensues, increasing any already existing hypertrophy, and interfering materially with a healthy state of the organ.

In cases where the uterus is so bulky that it will not remain in its normal position even whilst the patient retains the recumbent posture, or where from any reason she is unable to rest up, much

good may be attained by the insertion in the vagina of a large tampon. This may be made of tow, oakum, or marine lint, or better still, of sheep's wool, which, in place of becoming compressed by moisture like cotton-wool, retains its elasticity, and thus keeps up pressure, if a perineal bandage be worn at the same time.

In order to lessen hyperæmia and to exercise a constricting influence upon the vagina, it is well to soak the tampon in a mixture of the glyc. acid. carbol. (1 part), glyc. acid. tannici (4 parts), and glycerin pur. (7 parts). This effectually prevents any decomposition taking place, produces a considerable amount of watery discharge, and enables us to retain the tampon *in situ* for a day or two at a time, without the necessity of removing it or the fear of setting up any unpleasant discharge.

Where ulceration had been noticed previous to the return of the procident mass, astringent injections will facilitate their healing, or nitrate of silver may be employed. Touching the surface over lightly two or three times a week with the lunar caustic, or painting with a solution (℞j-5ss ad 5j aq.), will expedite the healing process.

Where the prolapsus is of comparatively recent occurrence, the vagina only moderately relaxed, the uterus not hypertrophied, the perineum uninjured, and the general health not greatly debilitated, rest in the horizontal position, the insertion of a tampon, and afterwards the employment of strong astringent injections, may be sufficient to restore the parts to a natural condition and thus prevent any subsequent prolapse.

The uterus being replaced in its natural position not only tends to recover its original size, but the strain upon the ligaments which ordinarily support it being removed, an opportunity is given them of recovering to a great extent their proper tone.

The vagina also becomes corrugated, and in time contracted, by the astringent injections, and thus aids materially in affording support to the uterus. The vulva at the same time regains somewhat of its natural resiliency, and thus the several factors that tended to produce or keep up the prolapsed condition are gradually eliminated or at least diminished.

During the time the patient is resting up, careful attention must be given to the regular daily evacuation of the bowels so as to avoid all straining or pressure. The bladder also should never be allowed to become distended to any extent. Where any tendency to cystocele exists, the patient should be instructed to pass water in the knee-shoulder position, or the pouch should be pressed up at the time so as to ensure complete emptying of the viscus each time. At the recurrence of each menstrual period, the recumbent position should be enforced as far as possible, as the uterus is always heavier at these times.

Every means should be resorted to to improve the general health and tonicity. Tonics, such as iron and quinine, strychnia, ergot, bark, and acid, should be administered. Sea-bathing, where it can be indulged in, not only acts very beneficially locally, but also improves the state of the general health.

The best astringents for vaginal injections are strong solutions of alum, sulphate of zinc, iron alum, and tannin. These may be used morning and evening, two or three pints of cold water having first been injected. The strength of the solutions may gradually be increased from $\mathfrak{z}\text{j}$ ad $\mathfrak{z}\text{j}$ to as much as $\mathfrak{z}\text{ij}$ or iv ad $\mathfrak{z}\text{j}$. Cold hip-baths, injections of salt- or sea-water, are also of service.

Another and a very effectual method of applying astringents to the vagina is by wrapping up a teaspoonful or two of powdered alum or other astringent in a piece of prepared cotton-wool or small muslin bag, and inserting this into the vagina. This can readily be done by the patient herself, either directly or by means of the suppository tube. Injections of cold water must then be employed.

Prepared wool saturated with alum, tannin, etc., can be procured at many of the leading chemists, and when made into plugs with a piece of twine, answer the purpose very well.

Tannin and other suppositories may be employed at bedtime or when the patient remains lying down; but they are not so cleanly as the plugs, and should only be used where, for any reason, the patient objects to the latter.

There are certain means adapted to obviate downward pressure which are too often neglected, but which assist materially both in the prevention as well as the relief of prolapsus uteri. The employment of skirt suspenders, by means of straps passing over the shoulders, enables the patient to sustain the whole weight of the underclothing from the shoulders, in place of allowing the constant dragging upon and compression of the lower abdomen by the garments, as is too frequently the case.

A carefully adjusted abdominal belt that does not extend too high up, may assist in lifting the abdominal viscera and preventing them pressing unduly on the pelvis.

All tight-lacing, or employment of corsets that compress the thorax and press the viscera downwards, should be strictly forbidden.

Whilst the patient remains in bed it is a good plan to elevate the foot of it six inches, so as to favor the return of venous blood, and thus lessen congestion of the pelvic viscera.

Pessaries.—We have already indicated the steps that should first be taken in replacing the uterus and encouraging a healthier action of the pelvic organs, before resorting to any mechanical appliances to retain the uterus *in situ*.

The term of pessary is an example of the change that takes place in the meaning of a word, until it no longer signifies the thing it stood for. Pessary, from $\pi\acute{\epsilon}\sigma\sigma\omega$ to soften, originally meant a soluble substance placed in the vagina, as a suppository is in the rectum. Dr. Barnes suggests a far more appropriate term, Hysterophores ($\psi\sigma\tau\epsilon\rho\alpha$, womb, and $\phi\acute{\epsilon}\rho\omega$, I bear), for instruments employed in retaining the uterus in position.

Objections have been raised to their employment on the plea that they are unscientific, that their usefulness is only palliative and temporary. Whatever objections, however, may be urged, there is

little doubt that they offer a valuable method of relief for a large number of cases of prolapsus, as well as for other forms of displacement.

It will generally be found that those who are most opposed to their employment have seldom if ever tried them, or only so rarely that they have never acquired the requisite experience to ensure a successful result.

The practical advantage, however, that is gained far outweighs any amount of theory. Even granted that the usefulness of pessaries is only palliative and temporary, that is no reason why we should discard them. As well might we object to the application of splints to a fractured limb, or of a truss for a hernia, or of any orthopædic instrument for the cure of deformity.

The object of a pessary or hysterophore is to support and retain the uterus in its normal position in the pelvis without unduly distending the vagina or setting up any irritation. In the large majority of cases of prolapsus in the first and second degree, a Meigs's oval elastic ring, or a Hodge's lever pessary, variously shaped to meet the requirements of each case, will answer the purpose, provided the perineum has not been seriously ruptured.

As long as the vagina retains any amount of contractility, we must be careful not to destroy or diminish this property, but make use of it.

Hodge's Pessary is the one of all others that offers the greatest number of advantages with the fewest drawbacks. It is made of various materials—vulcanite, copper wire covered with gutta-percha, pliable metal, etc. The two latter are as a general rule more serviceable in that they can be moulded by the practitioner at the time, to suit the requirements of each individual case, or can be altered in shape from time to time should it be found requisite.

FIG. 33.



Hodge's Pessary.

The best form for general purposes is a sigmoid shape, the upper or sacral end being somewhat wider and flatter than the lower or pubic limb (Fig. 33). Having formed an approximate idea of the length and capacity of the vagina, we should select a Hodge of such a size that the upper limb will fit into the posterior cul-de-sac, and the lower limb rest behind the symphysis pubis above the meatus urinarius. Too large an instrument must not be inserted, otherwise its action as a lever is interfered with, the vagina is unduly stretched, its elasticity impaired, and inflammation or ulceration very liable to occur.

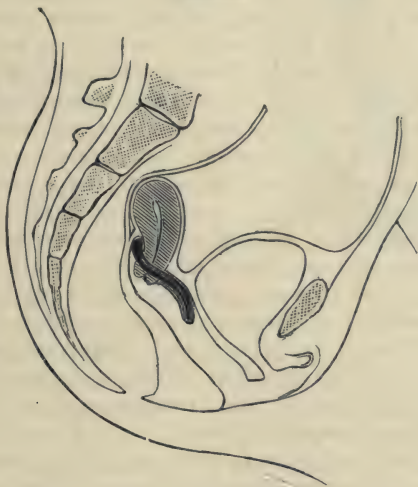
It is essential that the Hodge should be freely movable, merely held in the vagina, floating as it were in the pelvis, and not taking any bearings upon the walls themselves.

Its action is that of a lever; the fulcrum being a transverse axis, nearly through its centre, upon which the Hodge revolves when grasped by the vaginal walls; the power is the pressure of the anterior vaginal wall upon the lower limb, increasing during in-

spiration, or exertion, or by any expulsive effort, when the intestines are driven down upon the uterus and bladder, causing the anterior vaginal wall to descend; the weight or resistance is the fundus uteri, which is pushed up by the posterior limb as it rises in the opposite direction, lifting the roof of the vagina and the uterus, tilting the fundus somewhat forwards.

To Introduce a Hodge's Pessary.—Having first replaced the uterus, the patient lying in the semi-prone position, with the hips close to the edge of the couch, the thighs well flexed upon the abdomen, the feet resting one upon the other, the pessary being well oiled, is taken in the right hand. The index-finger being pressed firmly against the inner surface of the upper or sacral extremity, the concavity of which should look forward, is opposed by the thumb, so

FIG. 34.



Hodge in situ; Uterus slightly retroverted.

as to hold the pessary securely edgewise. The perineum being retracted by the left index-finger, the instrument is guided into the vagina in an oblique direction, so as not to press upon the sensitive structures anteriorly in the arch of the pubes, and is then directed quickly and firmly along the posterior wall of the vagina until the whole of the pessary is within the passage. The instrument as it passes up is rotated somewhat, so that the concavity of the upper or sacral curve looks forward. This should be guided behind the cervix into the posterior cul-de-sac or fornix of the vagina.

If the sacral curve be great, the tendency is for this to pass up in front of the cervix. Should this happen, the index-finger of the right hand passing through the pessary, presses or hooks the upper limb backward behind the cervix, at the same time pushing it upwards into the posterior cul-de-sac. The cervix then occupies the central space, the anterior or pubic extremity of the instrument rest-

ing upon the anterior wall of the vagina behind the pubic arch, with its convex surface facing forwards, sloping as it were, under the pubes.

It is not always necessary to retract the perineum by the left index-finger. The pressure of the instrument alone is often sufficient, and we gain the further advantage of the perineum replacing the thumb, so that the extended index-finger can carry the pessary up rapidly along the posterior vaginal wall, without the thumb offering any obstruction to its progress.

When properly adjusted, the instrument should cause no discomfort. Should it do so, it is probably too large or not suitable, and should at once be removed, and a smaller or a different-shaped one inserted.

As a rule, it is necessary to wear the instrument continuously for many weeks or months; but it should invariably be insisted upon, that the patient present herself within a few days, or a week at most, after it has been inserted, in order that we may determine whether it is likely to answer the requirements of the case, as also to satisfy ourselves that it is not causing any undue pressure likely to lead to ulceration or other mischief. It is advisable to remove the instrument every few months in order to see whether it has produced any chafing of the vagina, and to ascertain how far improvement has taken place. As long as it is worn, the patient should make use daily of vaginal injections, a combination of astringent and antiseptic agents being desirable.

The patient should be cautioned to attend to the proper regulation of the bowels; not to pass water in the ordinary squatting position, but to make use of the bed-chair; to avoid all unnecessary straining or violent exertion; to relieve the bladder regularly at least thrice daily; and to rest in the recumbent posture as much as possible at the menstrual periods.

She must be instructed not to interfere with the instrument in the way of removing it, unless it should cause inconvenience, and it is always well to explain, in the case of married patients, that the presence of the instrument does not necessitate their leading a single life.

In cases of patients living at a distance, instruction may be given how to remove and replace it at stated intervals, but it is comparatively seldom that we find a patient who will trust her own powers of adjusting it properly.

After having worn the support for several months, and having employed astringent injections, and other remedies calculated to improve the general health, it will be well to remove the instrument for a time, to see if the uterine ligaments have recovered their tone, and whether the uterus will remain in its normal position. In many cases, it will be found that the instrument may be changed for a smaller one after a few weeks' interval, when the parts are less relaxed and the uterus itself less bulky.

It is not always that we can succeed in adjusting a Hodge satisfactorily at first, but we must not be deterred from making further attempts because we happen to fail with the first one. The shape

of the Hodge can be altered to suit the requirements of individual cases. The pubic curve may be lessened, and the end made broader, so as to rest behind the arch of the pubes and give support to the base of the bladder.

In place of the Hodge being bent in the ordinary sigmoid form, it may be made into a semicircle, as suggested by Dr. Galabin (Fig. 35). The anterior limb then rests high above the pubic arch, distending the anterior vaginal wall, with the base of the bladder, into a pouch, and does not press against the rami of the pubes at all. This form is specially suitable in those cases where the vaginal vault is much relaxed. It fails if the vaginal cervix be so atrophied that it does not retain the posterior limb of the pessary behind it in the posterior cul-de-sac.

It is somewhat less easy to introduce than an ordinary Hodge, owing to the difficulty experienced in hooking the posterior limb backward over the cervix into the posterior cul-de-sac. In proportion to this difficulty is the security of its retention.

Hodge's pessaries are made of various materials, of which the principal are vulcanite, gutta-percha, block tin, pliable metal composed of tin and lead, or of copper wire covered

with india-rubber tubing. They can also be made of aluminium, silver, or copper tubing plated, and celluloid or coralin.

Vulcanite is by far the best material, being light and durable, retaining its smooth polished surface even after many years' wear. Its chief disadvantage is that it is difficult to alter the shape originally given to the pessary, so that unless we have a considerable number to select from, much delay occurs should it be requisite to modify the shape in any way. This may be done by placing the pessary for a few minutes in boiling water, extracting it by the aid of a pair of forceps, and then making the necessary alteration in shape by bending it with the fingers, holding it, if necessary, in a thin cloth to avoid injuring the fingers. It is then plunged into cold water, and held there until it is again hard, which takes place in about a minute or two.

Another plan is to lay the pessary close to a bright fire for a few minutes, until it becomes pliable, when it may be moulded as desired, and set firm by holding it for a minute in cold water as before.

If only a slight alteration of shape be needed, the surface of the pessary may be oiled, and the instrument moved rapidly backwards and forwards through the flame of a spirit-lamp until it be sufficiently pliable. Care will be needed to avoid burning the surface, and so spoiling the polish.

Celluloid or coralin has recently been employed in the manufacture of Hodge's pessaries. It is similar in many respects to

FIG. 35.



Galabin's Pessary.

vulcanite as to hardness and lightness, and can be moulded by placing it in boiling water. It is of a pretty coral-like color.

Copper wire covered with gutta-percha, so that the thickness corresponds to about one-third of an inch in diameter, forms a useful material for ordinary purposes. When slightly warmed, even at the ordinary temperature of the room, the pessary can be readily altered in shape, shortened or lengthened, curved or straightened, to suit the requirements of the case. If the least crack occurs in the gutta-percha, a heated knitting-needle and a small scrap of fresh gutta-percha are all that are needed to make good the defect, taking care to smooth the surface well before adjusting the pessary. Even after remaining in the vagina for a twelvemonth or longer, provided injections for the sake of cleanliness have been employed, the pessary will be found to be as perfect as the day it was inserted.

Copper or other wire, covered with india-rubber tubing, is often employed in the manufacture of Hodge's pessaries. It is more

FIG. 36.



FIG. 37.



Dr. Greenhalgh's Elastic Spring Pessary, with india-rubber transverse bands.

liable to become sodden with the secretions, and thus set up irritation, than is the case with gutta-percha, but still forms a useful material for the construction of the annular rings and other elastic forms of pessaries, and is useful where an elastic end is preferred.

Flexible white-metal is now often employed for pessaries. It is somewhat heavier than vulcanite, and is liable to become corroded after long wear, especially at the part where the tubing is joined. They can be easily moulded into any required form. Should it be requisite to persist in the wearing of a pessary for any considerable length of time, it can be either electro-gilt or nickel-plated, or fac-simile of it made of aluminium, platinum, or silver tubing, thus ensuring lightness, cleanliness, and durability.

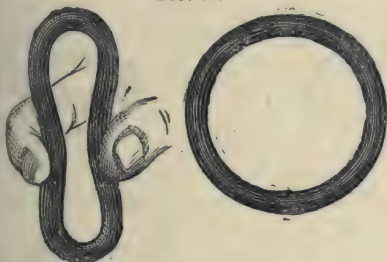
Where cystocele forms a marked feature in cases of prolapse, a barred Hodge, with strips of india-rubber passing across, is often of much service in preventing prolapse of the vaginal wall. Dr. Greenhalgh's modifications, with elastic end, answers well (Figs. 36 and 37).

Where the uterus is very bulky, the vagina very relaxed, and the perineum injured, a Hodge's pessary is seldom retained so as to be of any service. An elastic ring pessary, composed of spiral spring, covered with india-rubber, will often succeed in these cases. When compressed, as indicated in Fig. 38, it can be readily introduced, and has the advantage over the ordinary sigmoid Hodge's pessary, in that the elastic ring may be removed and reintroduced

by the patient herself without much fear of it assuming a wrong position owing to its flatness, the posterior portion passing naturally behind the cervix and not in front, as too often happens with Lodge's pessary.

Where the prolapsus is of the third degree, or the vagina so lax, or the perineum so torn, that the ordinary ring or lever pessaries

FIG. 38.



Annular Ring Pessary.

FIG. 39.



Barnes's Stem Pessary.

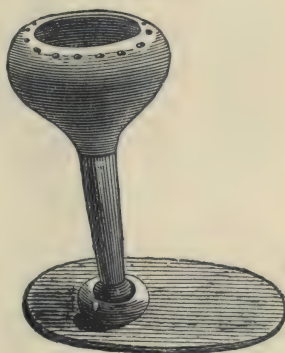
are not retained, we have still other forms of support that may be tried before resorting to some plastic operation.

The cup and stem pessary (Fig. 39), in cases where the vagina is contractile, is often self-retaining. It consists of a somewhat tapering hollow cylinder made of vulcanite, curved to correspond with the pelvic or vaginal axis, and an upper expanded portion or cup.

FIG. 40.

Cup and Stem Pessary *in situ*.

FIG. 41.



Duffin's Pessary.

When the vagina is sufficiently contractile to grasp this, the tendency is to carry the cone upwards, and so exert pressure upon the cervix.

It is only, however, in a limited number of cases that this form of pessary will be retained without external support. This is best accomplished by attaching the lower end of the cylinder to an oblong-shaped piece of stout india-rubber. Elastic bands formed of india-rubber tubing are attached to the margins of this, thus

enabling them to lie in the groove at each side of the labia, and not produce chafing by crossing directly from the end of the cylinder as represented in Fig. 40.

The stem may be either straight or curved, but if there be any

FIG. 42.



Cutter's Cup and Stem Pessary.

FIG. 43.



Cutter's Ring Pessary.

tendency to retroversion the former is preferable, as it tends to correct the displacement by pushing the cervix backward.

The advantage of this form of pessary is that it can be applied by the patient herself. It does not stretch the vagina, and being sustained by elastic supports, these yield at every inspiration, thus permitting the natural ascent and descent of the uterus, and also

FIG. 44.

Cutter's Pessary *in situ*.

obviating the effects of concussion or violence which rigid external supports would be likely to cause. To introduce it, insert the left forefinger just within the vaginal outlet, press the perineum backwards, and then pass the cup end of the stem in a direction back-

wards and upwards, being careful to avoid allowing it to press against the symphysis pubis. It should be removed every night at bedtime, and an astringent injection employed. The elastic bands will need renewal from time to time, as they tend to lose their elasticity. It is well to adjust the stem before rising, before the uterus has had time to become prolapsed. This form of pessary is specially serviceable in elderly women where the parts have become atrophied, the vagina having lost its contractility and the padding of fat having become absorbed.

Duffin's Pessary (Fig. 41) is a useful form in some cases of prolapsus in elderly females. It consists of a boxwood stem and cup, working in an ivory ball-socket on a shield which is kept approximated to the vulval aperture by means of a napkin worn in the usual way.

Cutter's Pessary (Fig. 42) consists of a cup and stem which curves backward over the perineum, a piece of india-rubber tubing being continued from this and attached to a belt surrounding the abdomen by means of a strap. It has been spoken very favorably of by Thomas, and may be tried where others fail. It is more liable to get displaced than the other form of cup and stem pessary, and the perineal tube often sets up irritation. Another form of this pessary is where the stem passes anteriorly over the symphysis pubis. This is less convenient in practice than the former variety.

If the cup-shaped form be objected to, the ring modification (Fig. 43) may be employed.

There are certain objectionable forms of pessaries which it will be well to indicate. These are the globular boxwood pessary, Fig. 46, the large circular disk-shaped pessary, Fig. 45, and all the countless modifications of these which depend for their efficacy upon their bulk. By constantly distending the vagina they destroy any remaining contractility that may exist, and often set up a considerable amount of inflammation or ulceration, with

offensive purulent or sanguineous discharges. They are still employed by many old-fashioned patients, who wear them for a number of years consecutively without removal. When, however, they attempt to accomplish this latter, they find the vulval orifice has become so contracted, as well as rigid, that it is impossible to withdraw the pessary. Under these circum-

stances we may be applied to for assistance. In the case of the circular or oval boxwood pessary, we may sometimes succeed in removing it, by passing one or two fingers of the left hand per rectum and pressing the mass downwards, assisting meanwhile by counter-pressure with the right forefinger on the anterior portion of the globe.

FIG. 45.

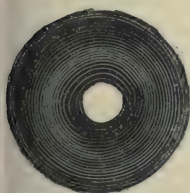
Elastic Gum Ring
Pessary.

FIG. 46.

Globular Box-
wood Pessary.

Where this manœuvre does not succeed, a pair of large ovum forceps may be introduced per vaginam, and attempts made to grip the pessary and withdraw it, assistance being given if requisite by the finger passed per rectum as before. It may be necessary to incise the margins of the vulva before we succeed, but this plan is better than using violence.

The same difficulty is often encountered with the large circular disks. They have been known to find their way, by ulceration, wholly or in part into the rectum or bladder. The cervix uteri has also in some cases become incarcerated in the central aperture.

The only form of pessary that acts by distending the vagina in order to retain the uterus in position, to be recommended, is Gariel's air pessary, made of india-rubber prepared so as to resist moisture. It can be introduced in a state of collapse by the patient herself, and then inflated by means of a small air-pump, being retained during the day and removed at night.

Zwanck's Pessary (Fig. 47), or as modified by Dr. Godson (Fig. 48), acts by distending the upper portion of the vagina laterally,

FIG. 47.



Zwanck's Pessary.

FIG. 48.



Godson's Modification of Zwanck's Pessary.

preventing the cervix protruding externally. The expanded wings, with their narrow margins, often exert such an amount of pressure upon the vagina as to produce ulceration, and not infrequently become buried in the tissues. Granulations occur, which, projecting through the circular holes, often unite and form a band, which incarcerates the pessary, and renders its removal a work of much difficulty.

It is an unscientific instrument, and should never be employed where other more rational measures can be adopted. Among hospital patients, who are unable to rest up, or unwilling to undergo any operation for the cure of prolapsus, where a Hodge is not retained, the employment of a Zwanck's pessary affords in many instances the only means of relief at our disposal. It should always be removed at night and replaced in the morning before the uterus has had the opportunity of descending.

To introduce it, the click at the end is unfastened, so as to enable the two wings of the pessary to be closely approximated to

each other. The right forefinger is then placed on the hinge between the two halves of the stem, and the pessary inserted by pressing obliquely on the perineum, guiding the wings upwards towards the hollow of the sacrum. When the tips of the wings have reached the cervix, the two halves of the stem are brought together and the wings thus expanded, the ends being secured by the click.

Where the parts are very relaxed, and the uterus bulky, it is often advisable for the patient to wear a cloth or perineal bandage, to prevent the stem descending or causing inconvenience on sitting.

Where the original Zwanck's pessary is employed, the screw is turned so as to approximate the wings. The pessary is then inserted as above directed, and the screw turned so as to expand the wings. Three different sizes are sold, so that a suitable one may be selected for each case.

Removal is effected by reversing the above movements and pulling the stem downwards and forwards.

Duncan's Stem and Disk Pessary (Fig. 49) is still more liable than Zwanck's to set up ulceration unless carefully watched. The vagina contracting firmly round the disk, this latter either becomes imbedded in the walls, or in any case the escape of secretions from the upper part of the vagina is prevented. Decomposition of these takes place, and may cause considerable constitutional disturbance.

Simpson's Shelf-pessary has perforations in the disk which allow the secretions to pass, and thus obviates the defect of Duncan's.

Utero-abdominal supporters, consisting of a perineal pad attached by straps, passing before and behind, to an abdominal belt, are in some instances of service in affording support by pressing the posterior vaginal wall against the anterior, and so preventing the descent of the uterus. They are fitted with either a sacral or pubic padded metallic plate, the pressure of which relieves the sympathetic pains so often complained of.

Abdominal belts, as previously suggested, often afford marked relief by taking off the superincumbent pressure of the intestines, and so lessening the tendency to prolapse.

Surgical Treatment.—Where pessaries or hysterophores fail in supporting the uterus in its normal position, or where a more radical mode of treatment be indicated, there are several operative procedures that may be resorted to with a fair prospect of success.

Rupture of the perineum during parturition, being a frequent starting-point in the production of prolapse of the uterus, it is essential to remedy this defect whenever it is found to exist. This must be done in the ordinary way, by paring the edges, and bring-

FIG. 49.



Duncan's Stem and Disk Pessary.

ing them together by means of sutures, so as to obtain adhesion between the freshened surfaces, care being taken to restore, as far as possible, the perineal body. This alone will not always be sufficient to effect a permanent cure, as the perineum will again dilate if the uterus be allowed to press downwards. A Hodge's, or other appropriate pessary, will still be needed, and will now be retained, where before it was readily expelled.

The integrity of the vagina being restored, and this being one of the chief supports of the uterus, the tendency to prolapse is thereby lessened, but time will be needed to remove other factors that may have been present, as tending to produce prolapse or have arisen in consequence. Restoration of the perineum may prevent the complete expulsion of the uterus externally, but does not sustain the uterus *in situ*. It is important to bear this in mind, otherwise disappointment will ensue. The operation of perineorrhaphy can hardly be regarded as a radical method of cure, or even a permanent one. It should be undertaken more with the view of facilitating treatment, by enabling the vagina to retain a properly adjusted pessary, which will keep the uterus suspended at its normal level, and thus favor reduction of bulk, and enable the ligaments to recover their tone to a great extent.

Numerous operations, having for their object the narrowing or constriction of the vaginal canal, have been resorted to by various operators. Sims and Emmet adopt the plan of *anterior colporrhaphy* or *elytrorrhaphy*, of narrowing the anterior wall of the vagina, by removing a triangular portion of mucous membrane near the cervix, so as to strengthen or brace up the vagina near the junction of the cervix uteri with the bladder. Sims removes a V-shaped portion by means of curved scissors, and then brings the edges together by silver sutures, the cervix fitting into the pouch thus formed above.

Emmet closes the pouch by running a denuded strip, as a base to the triangle, across in front of the cervix uteri. Owing to the difficulties experienced in completing this operation, he has since simplified it by denuding two surfaces, about half an inch square, on either side of the cervix, and a little behind the line of its anterior lip, then removing a strip from the vaginal surface, in front of the uterus, about one inch long by half an inch wide, and bringing together these three points, with the effect of forming a fold in front of the cervix. Schroeder freshens an oval portion, and secures adhesion by alternately deep and superficial sutures.

Huguier's operation consists in removing the whole of the cervix, and a portion even of the body of the uterus, by incision, slanting from without inwards, as well as the upper extremity of the vagina. It is a very formidable operation, and apparently is contra-indicated, according to Huguier, in the very cases which most demand relief.

The operation of *posterior colporrhaphy* or removal of a more or less considerable portion of the posterior wall, with the object of

thus contracting the vagina, has been advocated by Simon, Baker Brown, Hegar, and others.

Simon freshens a pentagonal surface, two and a quarter inches wide at the vaginal outlet, the posterior halves of the labia majora being included, the incision extending two and a quarter inches up the vagina, narrowing slightly towards the upper extremity, which is completed by two incisions meeting above at a very obtuse angle. The opposite edges of the wound are then brought together by alternate deep and superficial silk sutures. By the junction of the labia majora, the perineum is greatly lengthened, and additional support thus obtained. A pouch is thus formed in which the cervix rests, opposing a firm barrier to the exit of the uterus at the point toward which that organ naturally gravitates, the vagina being made narrower and more rigid. A perfect and permanent cure is thus effected, union taking place throughout the whole extent, a firm, dense, cicatricial band being obtained, running almost the whole length of the posterior vaginal wall.

Hegar narrows the vagina by the removal of a V-shaped piece of mucous membrane from the posterior vaginal wall, the apex being carried up nearly to the cervix, the base ending at the vulva, which it includes, as in the operation for ruptured perineum, thus narrowing the vagina, and making a firm perineum.

Where there is marked hypertrophic elongation of the cervix, it will be necessary to remove a portion of this by means of amputation; at the same time remove a triangular piece of the mucous membrane just in front of the cervix, the base of the triangle merging in the stump of the cervix, and bring the sides of the triangle together by sutures.

The operation of *Episiorrhaphy* (ἐπισιζῖον, the labium, and ράφη, suture), or closure of the vaginal outlet by uniting the posterior three-fourths of the labia majora, has been practised in cases of elderly women, where patency of the vagina is no longer necessary. The edges of the labia majora are pared, the labia minora removed, and the vivified surfaces united by silver sutures.

Le Fort recommended making a longitudinal septum by uniting the anterior with the posterior vaginal wall, thus producing an artificial duplex vagina.

Choice of operation.—This will depend materially on the nature of the individual case. Before resorting to any plastic operation, it is always advisable to enjoin rest in the recumbent posture, the foot of the bed being elevated, or the genu-pectoral position assumed from time to time, in order to diminish the bulk of the uterus, allow any ulceration of its surface to heal, and ensure a healthier condition of the vagina. If the perineum be ruptured, the perineal body should first be restored before any further operation be performed. If the cervix be elongated, it will be well to remove a portion of this at the same time that some plastic operation be done. If the uterus be prolapsed without marked elongation of the cervix, rupture of the perineum, or evident rectocele dragging down the uterus, the better plan is to perform anterior colporrhaphy, after the manner of Sims or Emmet.

If rectocele exist to any great extent, or the perineum be much dilated or ruptured, posterior colporrhaphy, together with perineorrhaphy, will be indicated.

If there be a combination of these several conditions, it may be necessary to perform more than one operation at successive intervals.

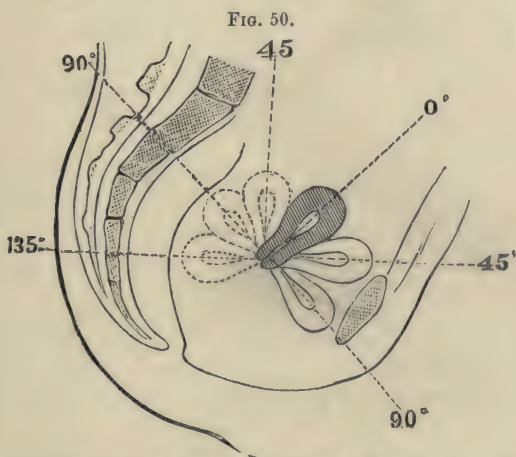
Various devices have been tried to procure contraction of the vagina without resorting to incisions, by means of the actual cautery, mineral acids, escharotics, ulceration created by galvanic pessaries, and sloughing produced by pressure by forceps and clamps. They have the disadvantages of proving excessively painful, more tedious and uncertain in their results, as well as being more unmanageable, and are therefore not to be recommended.

CHAPTER V.

DISPLACEMENTS OF THE UTERUS—*continued.*

Anteversion and Antelexion.

Anteversion of the Uterus.—The normal position of the uterus corresponds with the axis of the pelvic brim, and is therefore one of anteversion. This is represented by a line drawn from the umbilicus to the coccyx. The uterus occupies as near as possible the centre of the upper part of the pelvic cavity, being suspended between the rectum and the bladder, about midway between the symphysis pubis and the sacrum. It will thus be readily understood that the position of the uterus may vary considerably, depending upon the distention of either of these hollow viscera, and whether the patient be lying down or standing up. It is only



The degrees of Retroversion and Anteversion (after GALABIN). The dotted outlines show the various stages of Retroversion; the plain outlines those of Anteversion.

when the axis of the uterus is persistently altered from its normal direction, the fundus falling forwards, that the condition becomes pathological, and is spoken of as anteversion. It very rarely happens that the angle of deviation exceeds that of a right angle, or 90° ; the symphysis pubis generally prevents any further displacement of the fundus forwards, whereas retroversion, in extreme cases, may amount to as much as double this, or an angle of 180° (Fig. 50). In some extreme cases the fundus may fall behind the pubes almost parallel with the axis of the vagina.

Causation.—Any condition tending to increase the weight of the

uterus, such as congestion, early pregnancy, the presence of a fibroid tumor in the wall of the uterus, areolar hyperplasia of the body of the uterus, or subinvolution, may produce anteversion.

Any excessive intra-abdominal pressure, when the uterus is retained at its normal level, may lead to this displacement, such as violent muscular efforts, tight-lacing, wearing heavy clothing, the pressure of abdominal tumors, and other similar conditions.

The presence of cystocele not only deprives the uterus of support in front, but also tends to produce anteversion by the traction exerted when the prolapsed pouch of the bladder becomes distended with urine. Excessive inclination of the pelvis disposes to anteversion. Coitus itself may produce the displacement in those cases where the vaginal portion of the cervix is driven backwards and upwards.

Symptoms.—But little inconvenience may be occasioned by a moderate degree of anteversion. Where, however, the uterus is enlarged, and the displacement well-marked, the uterus lying horizontally across the pelvis, the functions of the bladder and rectum become interfered with. Frequent desire to pass water without any feeling of relief afterwards, dysuria and even retention, are prominent symptoms. These would probably be more often noticed were it not for the fundus falling obliquely over to one or other side, and thus avoiding the neck of the bladder.

The cervix pressing against the posterior vaginal wall, dysmenorrhœa and sterility are induced. Pressure on the rectum tends to produce irritability of the bowel, constipation, diarrhœa, tenesmus, or pain on defœcation.

Leucorrhœa, menorrhagia, dysmenorrhœa, and dyspareunia are generally marked symptoms. Discomfort on standing or walking, or even inability to get about, is occasionally witnessed, but not so often as in cases of retroversion.

Diagnosis—Examination per vaginam detects the os uteri facing backwards, high up in the hollow of the sacrum, occasionally so high as to be reached with difficulty. The body of the uterus is found lying across the pelvis in the antero-posterior diameter, the fundus of the uterus resting on the symphysis pubis.

On conjoined manipulation the fundus is not discovered in its normal position, but immediately behind the pubes, occasionally below the level of this. The uterus can generally be felt to move between the two hands. Rectal touch makes the position of the cervix still more evident, especially if the bimanual method be employed. The use of the sound is seldom requisite either for diagnosis or treatment. It should never be employed where there is a possibility of pregnancy being the cause of the anteversion. The only cases where its employment is indicated are those where it is desirable to ascertain the exact size of the uterus or to determine the presence of a small fibroid tumor. There is no other condition likely to be mistaken for anteversion if an ordinary amount of care be taken.

Treatment.—It is comparatively seldom that well-marked ante-

version, giving rise to troublesome symptoms, and necessitating treatment, occurs, unless there be some morbid condition of the uterus, such as subinvolution, hyperplasia, or the presence of a small fibroid.

Our first efforts then should be directed towards obviating the cause that led to the displacement.

The same preliminary treatment as indicated when speaking of retroversion, such as leeching, scarifying, hot-water vaginal injections, glycerin plugs, etc., should first be carried out, the patient meanwhile reclining in the dorsal position, and being instructed to hold her water for as long an interval as possible, so as to allow the hydrostatic pressure exerted by the distended bladder to press the fundus backwards.

If the external os uteri be small, and the uterus much congested, advantage will be gained by resorting to bilateral incision of the cervix. The depletion lessens the congestion, and the more patent orifice allows a more ready exit to the secretions, and thus lessens the tendency to future engorgements.

All abdominal pressure should be removed as far as practicable. If the abdominal walls be lax or the abdomen pendulous, much good will be derived by a carefully applied abdominal belt, with a pubic pad. This pushes the fundus backwards, and at the same time takes off the superincumbent weight of the intestines. All compression of the thorax by tight-lacing, or dragging of heavy clothing, should be avoided. Pessaries, or hysterophores, for the support of the displaced fundus, are far more difficult to adjust in the case of ante- than of retroversion. The natural tendency is for the anterior or upper limb to slip behind the cervix. Even when an anteversion pessary remains *in situ*, it often produces injury to the base of the bladder, and is seldom tolerated as well as a retroversion pessary. For this reason it will need to be very carefully watched at first. A patient should never be allowed to go away from observation wearing an instrument, unless she has been previously instructed how to withdraw it, which should be done at once on the occurrence of the least discomfort. In any case it will be prudent to rest up for a few days and avoid all exertion, or risk of injury from coitus. Frequent examinations should be made to see that no injury results from undue pressure, and that the pessary does not become displaced.

Mere elevation of the uterus by means of an ordinary Hodge's pessary will sometimes afford marked relief, though it does not in any way lessen the anteversion.

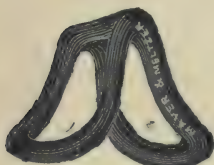
Numerous instruments have been devised for the cure of anteversion, some acting on the principle of pushing up the fundus through the anterior vaginal wall, which being arched is thus shortened, and so brings into play another principle, drawing the cervix forward by pulling upon the vaginal portion, the uterus being regarded as a lever which rotates upon its axis of suspension.

Graily Hewitt's Cradle Pessary (Fig. 51) answers very well in many cases. The large ring rests posteriorly, and thus gives the pressure

on the uterus higher and more anteriorly than when the crutch-shaped portion of the instrument rests in front, as delineated in the third edition of his work.

Fig. 52 represents the pessary in position. Of late a cross-bar has been added to the instrument, which prevents the cervix being caught between the two projecting arms of the instrument, and makes its use more tolerable in certain cases. Undue compression of the cervix may occasion troublesome sickness. To introduce the instrument, pass the larger ring in somewhat obliquely, pushing it inwards and backwards a short distance; pressure is then made on the middle saddle of the instrument, which thus passes close under the meatus urinaris, and shoots into its place. The lower end is then gently pushed a little upwards,

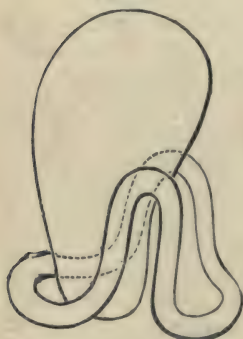
FIG. 51.



Graily Hewitt's Cradle Pessary.

and the operation is completed. The upright projecting saddle part must look upwards and forwards. The combined use of the sound and the cradle pessary is to be recommended in the majority of chronic cases.

FIG. 52.



Cradle Pessary in situ.

Thomas's Anteversion Pessary (Fig. 53) consists of a Hodge's pessary, to the anterior aspect of which a movable horseshoe lever is attached. This, when left to itself, rises at an angle to the Hodge, and presses up in the anterior cul-de-sac in front of the cervix.

To introduce it, press the two curved ends together and pass them into the vagina in the same way as an ordinary Hodge. The ends being carried as far as, and just under the cervix, the anterior arm or bow is thrown forward by the index-finger; the cervix falls behind it, the fundus upon it, the posterior bow going behind the cervix.

It requires some little practice to insert it properly. One great advantage of this instrument is that the patient can readily remove it by hooking the finger in the lower end and drawing it down, when the bow flaps back of itself against the base of the pessary. The practitioner should be careful to select one where the movable bow closes up to the upper and not to the lower limb, otherwise, though it may be easy of introduction, it will be difficult to remove it. Another form of this is Fig. 54.

Galabin's Anteversion Pessary (Fig. 55) has been "devised with the object of extending to the treatment of anteversion and of corporeal anteversion the principle of leverage which is so useful in posterior displacements.

"The instrument resembles a thick Hodge's pessary, with its anterior limb replaced by a broad arch directed upwards, and nearly square at its summit.

"By its shape alone, without any leverage, it elevates the ante-

rior vaginal wall in considerable degree, but it will be found in practice that the lower corners do not lie against the posterior vaginal wall, but the whole of the anterior extremity is tilted somewhat upwards in consequence of the tension of the posterior cul-de-sac.

“In introducing the instrument, it is first passed entirely within the vulva, with the upper limb in front of the cervix; the index-finger is then passed through it and hooks the upper limb backward over the cervix and into the posterior cul-de-sac. It is withdrawn by hooking the index-finger over one of the lower angles, and making traction upon that. Since it occupies a higher posi-

FIG. 53.



Thomas's Anteversion Pessary.

FIG. 54.



Thomas's Hinged Pessary.

FIG. 55.



Galabin's Anteversion Pessary.

tion in the vagina than even a Hodge's pessary, it can be worn without discomfort by married women. It is not suitable for virgins, or cases in which the vaginal outlet is narrow.”

Where an internal pessary cannot be tolerated, where anteversion is combined with partial prolapse, where married women object to the wearing of a pessary constantly, or where sustaining the uterus in its normal position requires more force than is prudent, the fundus may be elevated by means of a Cutter's pessary. The vaginal portion having a more considerable curve, with the concavity forwards, than the retroflexion pessary, allows the summit to rest in front of the cervix.

The patient, when properly instructed, can remove it at bedtime, and replace it before rising in the morning. When the parts are so sensitive that the hard bulb causes pain, an india-rubber cushion or piece of sponge may be affixed to the extremity, until the parts become less sensitive, or until a pouch has been formed in front of the cervix which will allow an internal support to be adjusted.

We should not rely merely upon mechanical treatment alone. Having relieved any local congestion or inflammation by appropriate measures, any granular degeneration of the cervical canal should be treated by the application of carbolic acid, nitrate of silver, iodine, or other agent. The general health should be looked to—tonics, such as iron and quinine, strychnia, or cinchona with

acids, prescribed; vaginal injections, astringent or simple, employed. The patient should on no account be confined to bed, or even to the couch, for any length of time, but encouraged to take regular daily outdoor exercise, either driving or short walks. In some cases the iodide of potassium or of iron internally, together with iodized cotton or tampons saturated with glycerin and iodine inserted up to the cervix uteri, have a beneficial action in reducing the bulk of the uterus.

Anteflexion of the Uterus.

This consists in bending of the body of the uterus at an angle to the cervix, the concavity being forwards. The normal condition of the uterus is one of slight anterior curvature, scarcely amounting to flexion. When this, however, is exaggerated to the extent of 15° or 20° it becomes pathological.

It may seem to some an unnecessary refinement to speak of three

FIG. 56.



Anteflexion of Uterus.

different varieties of flexion, but inasmuch as the treatment varies somewhat, depending upon the exact nature of the flexion, it will be well to adhere to the varieties mentioned by Thomas. These are:

1. Corporeal flexion, where the body is flexed, the cervix maintaining its normal position (Fig. 57).
2. Cervical flexion, where the cervix is flexed, the body remaining in the normal direction (Fig. 58).
3. Cervico-corporeal, where both body and cervix are flexed forwards (Fig. 59).

A rare form of antelexion occurs occasionally, when the cervix is flexed forwards and the body of the uterus backwards on its central axis.

Causation.—Flexions may be primary or congenital, or secondary or acquired. During early childhood the uterus is naturally more antelexed than is the case in the adult. Should this condition persist or become exaggerated after puberty the condition becomes pathological. Ordinarily, the walls of the uterus about the time of puberty become thicker, denser, and consequently stronger. If the development take place symmetrically, an equilibrium is established between the two walls, the uterus straightens itself, its anterior concavity disappears. But if the posterior wall develop more rapidly than the anterior wall, appropriating, as it were, an excess of nutrition, the congenital curve not only persists, but becomes exaggerated, the anterior wall undergoing a certain amount of atrophy, and so increasing the already existing disproportion. Congenital antelexion is of much more frequent occurrence than congenital retroflexion.

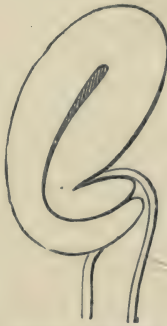
We generally find in these cases of congenital antelexion that the anterior lip of the cervix is shorter than normal; the uterus

FIG. 57.



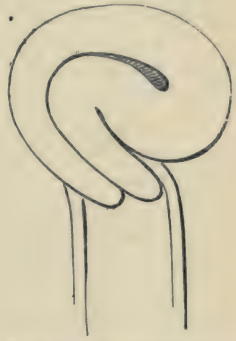
Corporeal Flexion.

FIG. 58.



Cervical Flexion.

FIG. 59.



Cervico-corporeal Flexion.

itself ill-developed, small; the cervix conical, and the external os also small.

In many cases there is evidence of imperfect development of the ovaries, and even of the bony pelvis itself. The vagina is often small, the anterior wall short—the whole sexual apparatus defective, often associated with entire absence of sexual feeling.

Secondary or acquired antelexion frequently occurs from unusual softness of the uterine tissues, such as met with in delicate, ill-nourished girls about the time of puberty. Tight-lacing, the suspension of heavy skirts from the loins, and other improprieties in dress, tend to force the intestines downwards and backwards. These pressing upon the posterior wall of the uterus carry the fundus downwards and forwards, anteversion and subsequently antelexion occurring in consequence. Endometritis may produce

flexion by creating an inward growth of the utricular glands into the submucous connective tissue near the os internum. This in consequence undergoes atrophy and enfeeblement, or the cervical glands, undergoing cystic degeneration, burst, and thereby cause a collapse of tissue in the formerly dense framework of the uterus, leaving in its place a flaccid net-like areolar tissue incapable of sustaining the organ in its normal position. A small fibroid developing in the wall of the fundus may cause flexion. Contraction of the utero-sacral ligaments from antecedent pelvic peritonitis or cellulitis may produce flexion by dragging the uterus backwards at its angle of suspension.

Habitual constipation from atony of the muscular coat of the intestine, associated as it frequently is with defective nutrition of the tissues generally, and softening of the uterine walls, is not infrequently productive of flexion.

In some cases, doubtless, ante flexion may be more or less suddenly produced from falls and other accidents, but in the large majority of instances the displacement is gradual. It may happen that anteversion passes by slow degrees into one of flexion.

It is comparatively rarely that we witness extreme cases of cervico-corporeal ante flexion, where the fundus is bent completely down upon the cervix, so that it is impossible even for the finger to pass into the angle of flexion, the uterus being simply doubled up.

"In cases of corporeal flexion the uterus is often high up in the pelvis, while in that of cervical form it is almost invariably low down. The cervical and cervico-corporeal varieties preponderate in frequency over the corporeal form in nulliparous women, this latter condition being generally met with in multiparous women." (Thomas).

The angle of flexion is generally most acute at the internal os, the cervical canal being flattened, and therefore obstructed, in cases of acquired ante flexion, whereas in primary or congenital ante flexion the curve is generally more uniform, owing to the tissue of the uterus being firmer, so that the cervical canal is less flattened, and consequently there is less obstruction to the passage of the secretions, although there may be difficulty in passing the uterine sound. As soon as flexion becomes marked, the circulation in the uterus becomes impeded. "The incompressible arteries still carry blood to the body, but the compressible veins fail to return it to the general circulation, and the consequences are congestion, œdema, and in time hypergenesis of tissue."

Symptoms.—Primary or congenital ante flexion is not infrequently associated with amenorrhœa, or with such scanty menstruation that symptoms of dysmenorrhœa are not produced. Where, however, the flexion is acute and the menstrual flow profuse, dysmenorrhœa is often one of the most distressing evidences of the displacement. It is usually synchronous with the first appearance of the catamenia, gradually increasing in severity with each successive period, as the uterus becomes more congested from the obstruction to the circulation. Patients who have experienced but

little inconvenience during their maiden career, after marriage often suffer severely at their periods, partly from the hyperæmia, the result of increased functional activity, and partly from a certain amount of inflammatory mischief being set up from mechanical violence, owing to the shortness of the vagina. The menstrual fluid being also increased in quantity after marriage, clotting of it is more liable to occur, and obstruction to its exit thereby increased, not only from the bending of the cervical canal but also from the fact of the smallness of the external os. In some instances this coagulation of the menstrual fluid leads to more or less perfect occlusion of the cervical canal, a clot becomes impacted, which effectually prevents the further exit of fluid, or coagulation may take place behind the seat of flexion, which, as we have seen, is generally at the internal os. The body of the uterus thus becomes gradually distended with the constantly increasing accumulation of fluid, giving rise to severe uterine tenesmus, often accompanied by most distressing nausea and even syncope and symptoms of collapse, the patient rolling in agony upon the floor. With the increasing distention of the body of the uterus, the axis of this latter gradually rises until it becomes more in a direct line with the axis of the cervical canal. A gush of pent-up menstrual fluid then occurs with marked relief to the patient, the fundus again falls forward, and another accumulation of fluid goes on with similar symptoms and a like ending. This may be repeated on and off for several days. Such patients often describe the flow as intermittent. They suffer considerably before it commences, then gain sudden relief as "the flow comes on all of a rush." This ceases, almost or altogether, for a day or so, and then comes on again suddenly and often unexpectedly. In some cases patients describe their periods as being horribly offensive, so much so that they are ashamed to go into society at those times. This almost invariably results from acute flexion, more commonly ante- than retroflexion.

In rare instances we meet with septic metritis or peritonitis as a consequence on the one hand of retention and decomposition of the menstrual fluid, on the other from reflux through the Fallopian tubes of some of the fluid into the peritoneal cavity. There is little doubt but that many severe cases of so-called dysmenorrhœa, attended by feverish symptoms, are really due to limited pelvic peritonitis, the result of effusion of menstrual fluid into the peritoneal cavity occurring in consequence of acute ante- flexion.

Apart, however, from dysmenorrhœa, patients complain of pain in the hypogastrium, with frequent desire to pass water; aching in the groins; pain on standing or walking, often so distressing as to compel them to keep mainly to the couch or bed; a sense of depression or sinking at the epigastrium, with more or less despondency; neuralgia and other nervous symptoms. Leucorrhœa is generally present.

In married patients, in addition to these symptoms, there is dyspareunia; occasionally menorrhagia, though not nearly so fre-

quently as in retroflexion; sterility as a rule, though if conception occur, abortion is not infrequent.

Diagnosis.—On inserting the finger into the vagina, if the case be one of corporeal antelexion, the cervix will be found much in its normal position. On pressing the finger upwards in the anterior cul-de-sac, the fundus uteri will be felt almost on a level with the os. On conjoined manipulation the fundus can often be pressed down still more on to the examining finger, and felt to move conjointly with the cervix, the angle of flexion being readily felt. In case of cervical antelexion, the os uteri is found looking forwards, the cervix directed backwards, as in an ordinary case of retroversion. On conjoined manipulation the fundus, however, is detected in its normal position, and not pressing on the rectum, as is the case in retroversion.

In cervico-corporeal antelexion, the cervix is directed backwards as in the last case; but the fundus is flexed and can often be felt in front on conjoined manipulation. The angle of flexion is often so acute that it is impossible to insert the finger between the fundus and the cervix. Impulse is communicated directly from the external hand to the finger behind the cervix, the double thickness of the fundus and cervix being felt between. In order to determine whether the rounded solid body in front of the cervix be the fundus uteri or a small fibroid of the anterior wall, the uterine sound, curved in accordance with the apparent amount of flexion, should be gently inserted, with its concavity directed backwards or forwards, as may be found most convenient, depending upon the direction of the cervix, as far as the internal os. Having reached this point, the handle of the sound is then made to describe a large semicircle, if it have been passed thus far with the concavity backwards, as will be most convenient where the cervix is flexed, so that the point is directed forwards. Pressing the handle well back towards the perineum, and, if possible, pushing up the fundus by the finger in the vagina, the sound is then passed beyond the internal os by gently pulling first upon the angle of flexion, and then pushing the point of the sound until it at length enters the cavity of the body of the uterus. Having effected this, the handle is then brought forwards so as to elevate the fundus. If, on examination now, the round solid body that was previously felt low down in front of the cervix has disappeared, and can be felt by the hand pressed in above the symphysis pubis resting on the point of the sound, we may be pretty certain that the case is one of antelexion, and not of fibroid. By moving the sound gently in various directions we can also gain information as to the mobility, sensitiveness, bulk, shape, and relations of the uterus.

In case of fibroid of the anterior wall the sound will probably pass in the normal direction, behind the tumor. The finger in the vagina will then be able to detect the increased thickness due to the fibroid, the hardness, irregularity, want of symmetry, and increased bulk of the uterus. Bimanual examination will still further assist us in coming to a conclusion. Other conditions oc-

asionally simulating antelexion are pregnancy, cellulitis, hæmatocele, tumors, or calculi in the bladder. In case of pregnancy, the history, softening of the cervix, increased bulk of the fundus, and disappearance of the tumor in front of the cervix when the patient is placed in the dorsal position, will generally enable us to distinguish it. If any doubt exist, it will be better to wait until the evidence is more distinct. The uterine sound should on no account be passed.

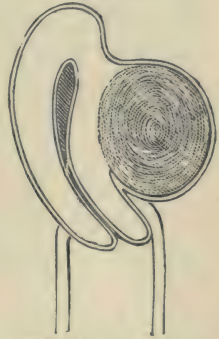
Swellings due to cellulitis or hæmatocele are generally fixed, irregular in outline, and have some special history. Tumor or calculus in the bladder would be recognized by passing the bladder-sound and feeling the mass between the sound and the finger in the vagina. If necessary, the urethra might be rapidly dilated and the finger passed into the bladder. The uterine sound, in the three last-mentioned conditions, passed into the uterus, will generally clear up the diagnosis.

Treatment.—The cure of antelexions is one demanding much patience, perseverance, skill, and experience. Not only will each individual case require some special plan of treatment, but what may seem to be the same identical condition in two different patients will often require essentially different management. A congenitally antelexed uterus, where the organ is only moderately developed but extremely rigid, may require more active and prolonged treatment than an acquired flexion, where the uterus is softer, bulkier, more congested, or more prone to inflammatory mischief.

Corporeal antelexion may often be remedied by measures quite unfitted for treating a case of cervical flexion. It may be well here to mention that it is not every case of antelexion that necessitates active treatment. Only such cases should be dealt with where the symptoms are plainly referable to the existing displacement. Under any circumstances we must first determine by tentative measures, such as passing the uterine sound, whether the uterus will tolerate interference, and not think of passing an intra-uterine stem until we have previously ascertained the probability of its presence being tolerated.

If any peri-uterine inflammation exist at the time of observation, or there is a history of such a condition having previously occurred, we should be extremely careful how we proceed, lest in our endeavor to overcome one evil we set up a greater, or rekindle into activity an inflammatory process that would otherwise have ultimately died out. The mere passage of the uterine sound has not infrequently given rise to an attack of pelvic peritonitis which has proved fatal. We should therefore endeavor carefully to estimate not only the *position* of the uterus as regards flexion, but also its *condition* in regard to congestion, inflammation, adhesions, etc.,

FIG. 60.



Fibroid in Anterior Wall of the Uterus simulating Antelexion.

as well as the condition of the ovaries, the presence of any surrounding tumefaction, or other condition likely to influence our treatment of the case. A patient who has been more or less confined to the couch, unable to take exercise, whose appetite is impaired, and general health much deteriorated, in consequence of a long-standing flexion of the uterus, will probably bear treatment far worse than another in whom the ante flexion has been accidentally discovered when examining to ascertain the cause of sterility, where there has been almost an entire absence of symptoms due to the flexion itself, beyond the sterility for which we are consulted.

In cases of primary or congenital corporeal ante flexion, and in acquired flexions of long standing, where the uterus is more or less rigid, we may first try what the occasional passage of the uterine sound will accomplish. The best time to commence treatment is shortly after menstrual period, within a few days. The sound having been passed into the cervix as far as it will go without difficulty, generally to the internal os, the point is gently insinuated beyond the angle of flexion by pressing the handle of the sound well back towards the sacrum, and alternately pulling and pushing the point over the seat of obstruction. Having succeeded in passing the point of the sound as far as the fundus, if much pain be thereby produced, it will be well to refrain from doing more than allowing the sound to remain in for a minute or two, and then withdrawing it. Should, however, its presence cause little or no inconvenience, the handle of the sound may be carried forward, the finger in the vagina pressing up at the same time the anterior cul-de-sac, so as to elevate the fundus uteri. By rotating the handle of the sound by a *tour de maître*, and then bringing it again forward, the fundus may be held back for a short time in a position of slight retro flexion. This movement may be assisted by the hand pressing externally on the abdomen just above the pubes. If no marked inconvenience arise, the passage of the sound may be repeated at intervals of three or four days, to within a week of the expected return of the catamenia. Should the pain usually experienced at this period be much lessened, the occasional passage of the sound about once a week, for a short time, although it will not cure the ante flexion, will often prove sufficient to relieve urgent symptoms. If it be deemed expedient to attempt more, we may proceed to dilate the cervical canal by means of graduated bougies, increasing the size each time, until a No. 10 or 12 will pass readily. This will have the effect of stimulating the development of the uterus, at the same time overcoming the constriction at the internal os.

Chalybeate tonics, such as the citrate of quinine and iron with strychnia; a pill containing phosphorus, iron, and nux vomica, or other suitable form; should at the same time be given, so as to improve the tone of the general health.

Another method of accomplishing the same object is, by inserting a small laminaria tent within the canal of the uterus, and

allowing it to remain in for eight or ten hours. This produces softening of the wall of the uterus, straightens out the flexion, and stimulates the development of the uterus. It is, however, not unattended by risk, and should never be resorted to until we have previously ascertained whether the uterus is tolerant of interference. The safest time to attempt it is a week or so after the menstrual period. The better plan is to pass the tent between the hours of 9 and 11 A.M., the patient remaining in bed. The tent should then be withdrawn between 6 and 9 P.M. A morphia suppository may be employed if much nausea or pain be produced. The following day the patient should be confined to the couch until the uterus has had time to contract again. She should keep lying on the back, and allow the bladder to remain distended as much as possible. If no inconvenience arise, the patient may resume her ordinary duties after this. The same process may be repeated again in ten days' or a fortnight's time. It is not a prudent plan to insert a tent whilst in the consulting-room, and then allow the patient to return home. It should invariably be done at her residence when she is in bed.

In single women the dysmenorrhœa, irritability of the bladder, and other symptoms are often thereby much improved, and in the case of married women, impregnation not infrequently takes place.

Galabin's, Thomas's, Hewitt's, or other appropriate form of Anteversion Pessary may be inserted into the vagina with a view of supplementing the other measures adopted for straightening out the uterus, but as a rule they only tend to cause the uterus to revolve upon its axis of suspension, and do not succeed in straightening out the flexion. It is difficult to exert any power upon the displaced fundus, and there are no natural forces called into play tending to accomplish this object, as in the case of retroflexion.

A Hodge's pessary is here as a rule of little avail, since the upper limb naturally inclines to the posterior cul-de-sac of the vagina. In some instances, in virgins, where the vaginal canal is small, it is possible to adjust a Hodge so that the upper limb rests on the anterior cul-de-sac, the fundus resting upon the end, the cervix passing through the instrument, the lower limb lying parallel with the posterior wall of the vagina. A long, narrow pessary, well curved at its upper extremity, should be selected. Hewitt's Cradle Pessary (Fig. 51), according to the author, answers the purpose perfectly of supporting the uterus in the state of rest required.

Dr. Fancourt Barnes has devised an ingenious combination of Dr. Graily Hewitt's Cradle Pessary, with the ordinary Hodge's pessary as used in retroflexion and retroversion of the uterus (Fig. 62). The cradle portion is capable of limited movement, being attached to the Hodge's portion by watch-springs. The pessary is introduced and placed *in situ* in the same way as in a Hodge's pessary. The advantages claimed are that the Hodge portion forms a firm *point d'appui* for the cradle portion—which when used

alone often becomes displaced—and that the cradle portion is unable to become displaced behind the os uteri.

Where it is found that the uterus does not resent interference, and that the advantage gained by occasional dilatation of the cervical canal is merely temporary, the dysmenorrhœa, or the sterility, or both remaining uncured, we may try the effect of introduc-

FIG. 61.



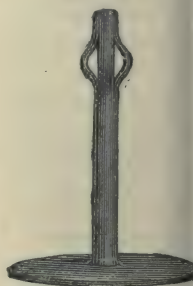
Antelexion of Uterus, showing position of Hodge's Pessary.

FIG. 62.



Fancourt Barnes's Antelexion Pessary.

FIG. 63.



India-rubber Stem Pessary.

ing a pliable india-rubber stem (Fig. 63). Those usually met with are far too thick, the diameter of the stem should not exceed one-sixth of an inch. They are made of white, red, and pure black india-rubber. The black is the most durable, and should be chosen by preference.

A bulging projection near the extremity assists in retaining them *in situ*. Those having the shield perforated are to be preferred. Although soft, elastic, and easily bent while out of the uterus, it becomes sufficiently firm when pressed equally on all sides by the canal of the cervix to gradually overcome all flexions, except in cases where the uterus is bound down to the surrounding parts. When the stem has been worn for some time, the enlarged and firm uterus becomes greatly reduced in size, and so soft as closely to resemble that organ in the early stage of subinvolution, effects probably due to the freer exit of the secretions and the mucous discharge, which usually persists during the retention of the stem. It may be readily introduced on the end of an ordinary uterine sound, a Playfair's probe, or other similar instrument, which by elongating the stem somewhat obliterates the projection for the time being, and allows the stem to pass.

It is not necessary to dilate the cervix by a tent before introducing the stem, though the passage of a No. 8 sound will facilitate its introduction. As a rule, it is quite self-retaining. Should there be any tendency to slip out, a plug of cotton-wool saturated with glycerin may be pressed up against the shield so as to keep the stem *in situ*.

Where the vagina is very small, the elastic stem is passed with far greater facility than any of the ordinary stems with a large

solid shield, and owing to its bending slightly when *in situ*, it is far less liable to be shot out, as not infrequently occurs with the solid stem.

Galvanic Stem Pessaries (Fig. 64), consisting of alternate coils of copper and zinc wire, so as to render the stem somewhat pliable, are useful in many cases of flexion. They are not so rigid as to counteract entirely the flexion, but by setting up a kind of a chemical, more than electrical stimulus, owing to the constant slow production of chloride of zinc, they tend to stimulate the development of the uterus, increasing the menstrual flow as well as the secretion of mucus.

To introduce one of these where the vagina is small is often difficult. Having previously dilated the cervical canal sufficiently by means of graduated bougies, the patient lying in the left lateral, or semi-prone position, the right forefinger is introduced into the vagina. The stem, supported on a tent-introducer, Playfair's probe, or uterine sound, is then passed alongside the finger until the disk impinges on the perineum, the extremity of the stem is meanwhile guided into the os uteri by the finger. When this is effected, the finger is partially withdrawn and made to press back the perineum, so that the disk may pass the vulval outlet, when, if the point had previously been directed into the os, the stem can then be passed along the cervical canal, until the disk approaches the cervix. The finger in the vagina, pressing up the fundus uteri in the anterior cul-de-sac, will assist the introduction of the stem. If much difficulty be experienced in passing the disk into the vagina, as not infrequently happens, it may be necessary to employ a small Sims's speculum to retract the perineum and expose the os uteri, so that the stem may be passed by sight instead of by touch.

The disk or bulb attached to these galvanic stems is usually made far too large for practical purposes. It may with advantage be lessened considerably. Should the stem show any disposition to slip out, a tampon of cotton-wool saturated in carbolyzed glycerin, or a small Hodge covered over with thin india-rubber (Fig. 65), may be inserted into the vagina so as to retain the stem *in situ*. Owing to the chemical action set up in the stem by the secretions, it becomes corroded and roughened, so that it is better to remove it every few weeks to see that no mischief arises, and to avoid any risk of the stem being broken.

Fig. 64.



Barnes's Galvanic Stem Pessary.

Fig. 65.

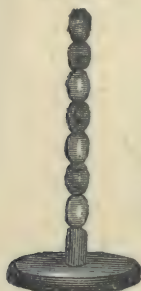


Pessary with perforated septum and spiral wire between extremities.

Galvanic stems are also made of alternate pieces of zinc and copper in various forms, which are rigid. These are more liable to produce mischief, unless closely watched. Peaslee's stem (Fig 66) is a good form to use.

Slightly curved vulcanite stems, hollow in the centre, and perforated as in Fig. 67, with a shield or disk at the lower end, are often of service where a rigid stem is preferred to an elastic one. Its length should be at least a quarter to half an inch less than the length of the uterine canal as measured by the sound, so as not to impinge upon the fundus. Where the flexion is acute or of long standing, there is a great tendency for the stem to be forced out beyond the angle of flexion, the

FIG. 66.



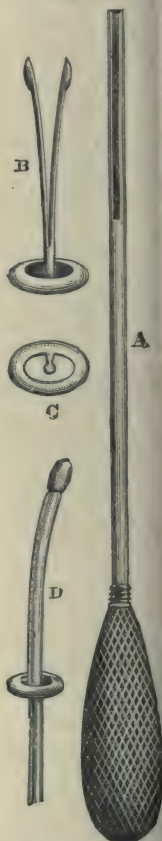
Peaslee's Stem Pessary.

FIG. 67.



Vulcanite Stem Pessary.

FIG. 68.



Wright's Intra-uterine Stem Pessary.

upper part of the stem remaining in the cervical canal. To obviate this, a plug of cotton-wool, as previously directed, may be inserted, or a covered Hodge as suggested by Dr. Wynn Williams. Where the uterus, however, is thrown into a position of anteversion on the insertion of the stem, the disk impinges on the posterior vaginal wall, and is thus prevented from slipping. A perfectly straight stem, whether of metal, vulcanite, or glass, should not as a rule be employed, since the natural form of the uterus is slightly curved.

Expanding stems will sometimes be retained when the ordinary straight stems are forced out. There are several varieties of these. As good a one as any is Wright's (Fig. 68), or Chambers's modification of it in vulcanite. The expanding branches of the stem are held together by the hollow cylinder of the introducer, which slides over them during insertion. They spring open as soon as the introducer is withdrawn, and thus make the stem self-retaining.

The disadvantage is that the diverging points tend to press on the interior of the sides of the uterus, and so set up irritation, more especially as the weight of the fundus is sustained on the two projecting points. Other expanding stems, consisting of a hollow stem

with diverging branches, are also employed. The great disadvantage of nearly all these is, that the diameter of the stem is too large for the majority of the cases in which their employment is necessitated.

In all cases where evidence of inflammatory mischief exists, this must be first remedied before thinking of resorting to any mechanical treatment. The application of a few leeches, puncture with the scarifier, injections of hot water into the vagina, the application of plugs of cotton-wool morning and evening, saturated with glycerin or with glycerin and iodine, rest in bed for a few days, saline aperients, and other appropriate remedies, must first be tried. The sound may then be passed, in order to ascertain whether the uterus will tolerate interference. If no severe pain or constitutional disturbance ensue, the same measures may cautiously be adopted as previously described. Commencing with the mere passage of the sound, we may gradually proceed to restoring the position of the fundus, dilating the canal by graduated bougies or a laminaria tent, inserting an elastic, expanding, or vulcanite stem; watching carefully lest any symptoms of mischief arise, desisting from further treatment the moment there is any evidence of intolerance of it. Where there is a marked history of previous gonorrhœal infection, pelvic peritonitis, or cellulitis, we should, as a rule, avoid resorting to mechanical interference.

After the introduction of an intra-uterine stem, it is better to keep the patient in bed for the first few days, and see her daily. If any febrile symptoms occur, the stem should at once be withdrawn. When these have subsided the stem may again be passed, but the patient must be carefully watched. She should always be either within reach, or be able to withdraw the stem by a string attached to it. It should, as a rule, be removed during the period of menstruation, until we have ascertained that the uterus tolerates its presence without inflammatory mischief ensuing, when it may be allowed to remain in during the periods. In the case of married patients it is well to avoid all risks by enjoining abstinence for a time, at least, as well as prohibiting all unnecessary exertion of any kind. There is always a certain amount of congestion, with increased secretion, as long as the stem is worn. On its removal, however, this soon subsides, and a process analogous to involution takes place. Impregnation not infrequently occurs within a few months. Even after parturition there is a great tendency for the flexion to recur, which may need treatment before impregnation again takes place. Flexions are generally of gradual production, not sudden, as is the case often with versions, so that we must be prepared to allow many months to elapse before expecting to straighten the uterine axis by means of a stem.

In those cases where difficulty is experienced in retaining a stem *in situ*, it may be necessary to resort to a combined intra-uterine stem and a vaginal support; but they should never be made in one piece, otherwise the mobility of the uterus is seriously interfered with, and the patient is exposed to danger from shocks. Still, cases will be met with that test our ingenuity and tax our patience to

the utmost, and, as these generally occur in patients determined to be cured, we need to have no end of devices to overcome the difficulties that beset us, and for this reason it may be well to mention a few of those most calculated to be of service.

FIG. 69.

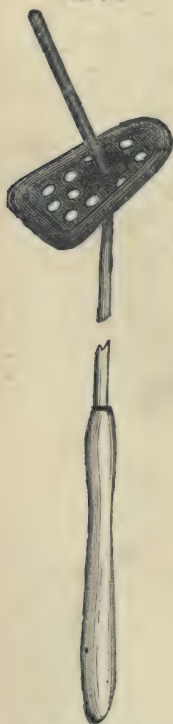


Thomas's Antelexion Pessary.

Thomas's Antelexion Pessary (Fig. 69) consists of two parts: a stem of solid glass or vulcanite, two to two and a half inches long, ending below in a rounded bulb. This being introduced below in the uterus is supported by an ordinary antelexion pessary, between the branches of which a shallow vulcanite cup has been fixed, with a small hole in it for drainage. The fundus is thus supported partly by the pessary, and not entirely by the intra-uterine stem.

If the flexion be acute, and the cervical canal contracted, a laminaria tent may first be employed to straighten and dilate the canal.

FIG. 70.



Wynn Williams's Stem Pessary and Introducer.

The stem is then inserted, and subsequently the pessary. The patient should remain in bed for three or four days, being watched carefully lest symptoms of irritation ensue. A small hole being drilled just above the shoulder of the stem, a silk thread is secured to the instrument, so that upon the first symptoms of mischief the patient can withdraw it by exercising traction upon the silk thread.

The instrument should be removed during menstruation, and also if pain, chilliness, or feeling of general languor or discomfort arise. The patient should never be allowed to go beyond the reach of help whilst wearing one of these.

Hewitt's Antelexion Stem Pessary consists of an intra-uterine stem, one and a half inches long, which is retained *in situ* by means of an oval disk of gutta-percha, similar in shape to a Hodge's pessary, covered over one-half by india-rubber sheeting. This disk is perforated so as to admit the lower end of the stem. The two pieces are introduced separately, and, as a rule, should not be worn during the menstrual periods.

Wynn Williams's Stem Pessary is constructed on the same principle: an intra-uterine stem being supported on a Hodge, covered with a diaphragm of perforated india-rubber, the bulb resting in a kind of socket or perforated cup (Fig. 70). The stem is first passed into the uterus on the end of a stilette or tent-introducer; the pessary, previously passed over the end of the rod, is then guided up into its place, the end of the stem being fitted into the cup.

There are several varieties of these combined instruments, each of which possesses different advantages as well as disadvantages.

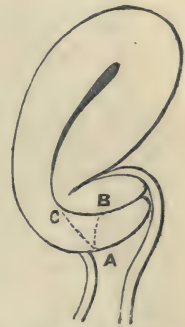
Cervical antelexion will require a different plan of treatment to that suggested for corporeal antelexion.

The better plan is to incise the posterior wall of the cervix, from the external os as far back almost as the junction of the vagina, A, so as to make the axis of the uterine canal almost continuous with the axis of the vagina (Fig. 71). The posterior lip of the cervix is first divided as far up as is prudent towards the vaginal cul-de-sac. The point of the scissors moving in the arc of a circle, A B, will thus leave a triangular portion, A B C, to be divided by means of a metrotome, ball and socket knife, or bistoury, passed along a probe as a guide.

Apart from this advantage, this single incision posteriorly is preferable to the bilateral incision, as sometimes recommended, as the edges do not gape or roll out so much after they have healed, the flaps being kept sufficiently in contact by the lateral walls of the vagina; there is less risk of hæmorrhage proving troublesome, and there is also less risk of cellulitis ensuing.

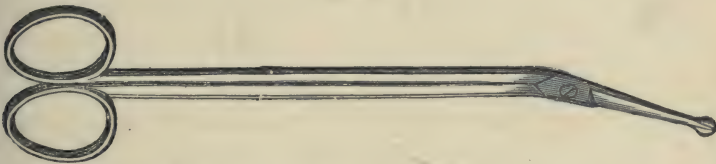
The operation should be performed either with Küchenmeister's scissors (Fig. 23), or with slightly curved, long-handled scissors (Fig. 72), the cervix being steadied by means of a tenaculum. A dossil of cotton-wool, steeped in liq. ferri perchl.,

FIG. 71.



Lines of Incision in Flexion of the Cervix. (After EM-MET.)

FIG. 72.



is inserted between the lips of the incision, to arrest hæmorrhage and keep the edges separate, so that they may not unite by first intention. The fundus vaginae is then packed with oakum or cotton-wool steeped in carbolized glycerin, and the patient kept at rest in bed. The operation has been already described when speaking of stenosis of the external os.

Where the flexion is very acute, and the vaginal junction lower than usual, after having divided the posterior wall of the cervix by means of the scissors, it may be necessary to extend the incision still further backwards by passing the blade of the ball and socket knife, with its cutting edge backwards, into the canal, and dividing the triangular portion that remains between the extremity of the first incision and the canal of the cervix.

Some authors recommend excising a strip of tissue, a quarter of an inch or more wide, from the posterior wall of the cervix, so as to obviate the possibility of the incision cicatrizing up again. Others have suggested removing the entire posterior wall of the cervix.

CHAPTER VI.

DISPLACEMENTS OF THE UTERUS—*continued.**Retroversion and Retroflexion.*

Retroversion of the Uterus.—*Definition.*—When the uterus, in place of being suspended in the axis of the pelvic brim, becomes tilted backwards, so that the fundus is directed towards the sacrum, and the os points forward towards the pubes, it is spoken of as being retroverted. The displacement may vary in degree from an angle of 90° to as much as 180° from the normal axis, the fundus being carried downwards until it rests upon the perineum.

Frequency.—Retroversion is not of frequent occurrence as an idiopathic primary lesion in the unmarried, nor is it common in those who have not borne a child.

Causation.—The predisposing causes are similar to those already mentioned when speaking of displacements in general.

The exciting causes are any influences tending to increase the weight of the uterus, such as congestion, pregnancy, subinvolution, fibroids, or hyperplasia. Weakening of the uterine supports, as met with in pregnancy, rupture of the perineum, and prolapse of the vagina, often give rise to prolapsus, with which retroversion is frequently associated.

The uterus may be retroverted by being forcibly displaced, as witnessed in cases of extreme distention of the bladder, any severe muscular efforts, blows or falls, tight-lacing or tight-bandaging after parturition, or the pressure of tumors.

The uterus may also be dragged out of place by adhesions resulting from pelvic peritonitis or cellulitis, or from retro-uterine hæmatocele.

Retroversion seldom occurs when the uterus is in a healthy condition. There is usually some antecedent pathological state, such as hyperæmia, enlargement of the body of the uterus, as in early pregnancy and subinvolution, especially if associated with prolapse of the vagina or rupture of the perineum.

We have seen that, as the uterus becomes prolapsed, it tends to become more and more retroverted, the cervix following the direction of the vagina, which is that of least resistance.

In the puerperal state, the uterus being greatly enlarged, the ligaments weakened from stretching, the vagina lax, the perineum often ruptured, the bladder allowed to become unusually distended, the patient being kept lying constantly on her back, and the abdominal binder being firmly applied, all tend to produce retroversion, which often persists even after the process of involution is completed.

Symptoms.—These will vary considerably, depending upon whether the displacement occurs suddenly, or, as is far more usual, gradually.

During menstruation, prolonged standing or walking, or any sudden exertion or succussion, may force the fundus backwards and give rise to urgent symptoms of *acute retroversion*, such as dragging sensations or pain from the stretching of the uterine supports, irritation of the bladder and rectum, with occasionally retention of urine and fæces, or tenesmus. There are often symptoms of shock, the agony in some cases being great, the patient being unable to stand. The uterus, owing to the displacement and the obstruction to the circulation, becomes still more congested. Throbbing pain, with bearing down, a feeling of weight and discomfort, and even expulsive pains if the uterus be much depressed, are experienced. Constitutional disturbances, with hysteria or other nervous phenomena, may also be present.

When retroversion occurs gradually, there may be few symptoms to indicate its occurrence beyond those which already existed as evidence of uterine disorder, with which this displacement is usually associated. There may be more or less discomfort in walking, standing, prolonged sitting, or on defæcation, pain in the sacral region, dragging sensations in the groins, frequent desire to micturate from pressure of the cervix against the neck of the bladder, together with vesical tenesmus.

Obstinate constipation, with sickening pain on defæcation, if the uterus be inflamed, rectal tenesmus, with excessive secretion of slimy mucus from the rectum, are often produced by pressure of the fundus uteri on the bowel. Dyspareunia is generally marked. Menorrhagia is occasionally but not invariably present. Acquired sterility is the rule. Where conception occurs, abortion during the first half of pregnancy not infrequently takes place.

In cases of retroversion of the gravid uterus, impaction in the pelvis often occurs, causing retention of urine, interfering with the passage of fæces, and producing much local distress as well as constitutional disturbance if the condition be not detected and relieved.

Diagnosis.—On passing the finger into the vagina, the cervix, in place of being detected near the centre of the pelvis, is found to be pushed over to the front, behind the symphysis pubis; the fundus is tilted backwards towards the concavity of the sacrum, often in an oblique direction, the fundus pointing somewhat to one or other sacro-iliac synchondrosis. The uterus is generally more or less tender on pressure. On conjoined manipulation, the hand pressing externally fails to detect the fundus in its normal position, and in cases where the abdominal walls are very lax, the fingers pressed well down behind the pubes may often be felt by the finger in the vagina. On passing the finger into the rectum the fundus can generally be felt very distinctly projecting on to the bowel, the finger passed up sufficiently high mapping out the contour of the fundus.

If any doubt exist, provided utero-gestation be not present, the uterine sound may be introduced in a backward and downward direction, when, if it be a case of retroversion, the sound will enter two and one-half inches or more, until it impinges on the inner surface of the fundus, when pain is almost invariably complained of. If the uterus be mobile, it may be redressed by making the handle of the sound describe a semicircle, the intra-uterine portion revolving as near as may be on its own axis, the handle being at the same time pressed backwards, so as to guide the fundus uteri forwards to its normal position, when it may be felt by pressing the hand externally over the pubes, the mass that had previously been detected posteriorly having meanwhile disappeared. Great care must be exercised not to use any force, lest adhesions exist binding down the fundus.

The conditions most likely to mislead us are:

1. Fibroid tumor of the posterior wall of the uterus.
2. Retro-uterine hæmatocele or pelvic cellulitis.
3. A small ovarian tumor in Douglas's pouch.
4. Hardened scybalæ in the rectum.

In the first case, the uterine sound passes in the normal direction, the fundus being felt anteriorly by pressure above the pubes and the sense of touch discriminates the increased bulk of the tissue intervening between the sound in utero and the finger in the rectum, or even in the vagina.

In the second case, the uterus is generally more or less fixed, the fundus in its normal position is ascertained by the sound, and the history of the case will also throw light upon it.

In the third case, the sound enters in the normal direction, the tumor is less hard and resisting than the fundus uteri, and is often capable of being moved independently of the uterus.

In the fourth case, the uterus is found to be in its normal position, the mass posteriorly can be indented by firm pressure with the finger, and may at once be diagnosed by examination per rectum.

Prognosis.—If adhesions exist binding down the fundus uteri posteriorly, whether as the result of pelvic peritonitis, cellulitis or retro-uterine hæmatocele, a guarded prognosis should be given as treatment may be contra-indicated, at least for some time.

If fibroid tumor be detected in the posterior wall, the prognosis will depend upon our being able to remove this.

Where the vaginal portion of the cervix is exceedingly short great difficulty will be experienced in adjusting any pessary, and our prospects of relieving the patient will thus be slight.

As a result of the displacement we often find more or less active hyperæmia or inflammation, which ultimately leads to hyperplasia. Pressure upon the neighboring structures may induce cystitis, or lead to the production of hæmorrhoids. Dysmenorrhœa and sterility, menorrhagia or leucorrhœa, are also often noted as complications.

Treatment.—The first indication is to restore the uterus to its normal position, provided there are no adhesions binding it down

and so preventing replacement. This may generally be most readily effected by placing the patient in the semi-prone position, as adopted when using Sims's speculum, or still better by resorting to the genu-pectoral position. The index-finger is then introduced per vaginam, and the posterior wall of this passage pulled backward, so as to allow atmospheric pressure to come into play. This alone may be sufficient to reduce the displacement.

When the patient is placed in the genu-pectoral position, the thighs being directly vertical or perpendicular to the surface on

FIG. 73.

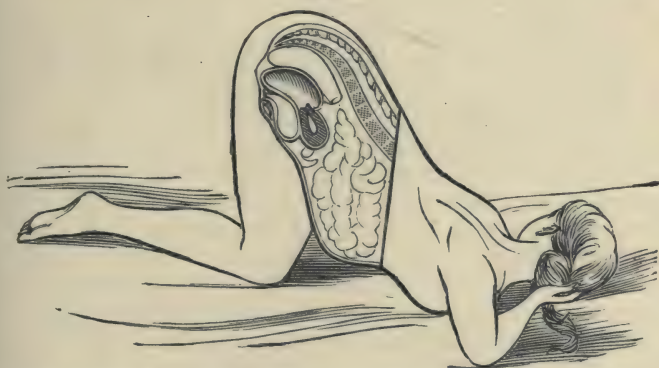


Retroversion. Genu-pectoral Position. (After CAMPBELL.)

which she kneels, the body inclined at an angle of about 45° to the horizon, we get the most complete reversal of the bearings of gravity of which the human body is capable, the inlet of the pelvis looks nearly vertically downwards.

The abdominal muscles being relaxed, we gain an additional ad-

FIG. 74.



Replacement of Uterus by Genu-pectoral Position. (After CAMPBELL.)

vantage in the draught of the viscera, and when air is admitted to the vagina, the atmospheric pressure enables the uterus to recede, and thus regain its normal position. Should, however, reduction not take place, the finger may be employed to press the fundus downwards and forwards during a prolonged expiration.

In some cases where the uterus is very bulky, as in instances of the gravid uterus about the third or fourth month, the insertion of two fingers of the left hand per rectum, so as to press the fundus downwards and slightly to one side, in order to avoid the promontory of the sacrum, whilst the index-finger of the right hand in the vagina hooks or pulls the cervix backwards, will enable us to replace the uterus when other methods completely fail. The advantages of the postural method, both for purposes of diagnosis and treatment, have been ably set forth by Dr. H. F. Campbell, of Augusta, Georgia, in a pamphlet on "Pneumatic Self-replacement of the Uterus."

Under no circumstances should any considerable amount of force be employed. If reduction be not readily effected by this method the presumption is that adhesions exist which prevent the replacement of the uterus. Further efforts should be desisted from for the time being, the patient being required to resort to the genu-pectoral position occasionally. This will lessen any congestion of the uterus that may be present, and also tend to stretch gradually any adhesions that may exist, and so favor ultimate replacement of the uterus. Steady hydrostatic pressure by means of an india-rubber bag or colpeuryuter, inserted per vaginam or per rectum, and distended with water, may be employed for a few hours daily with a similar object.

In some cases the insertion of a Hodge's pessary, with a view to stretching the adhesions, may be indicated, thus accomplishing gradual reduction of the displacement, where more rapid efforts would prove dangerous.

A method frequently resorted to to replace the uterus when retroverted is that by means of the uterine sound. This requires caution and should not be attempted by those who do not possess the requisite skill or dexterity in manipulation, as mischief may readily be done in a few moments that may require weeks to recover from.

The patient lying in the lateral or semi-prone position, the uterine sound is introduced as far as the fundus, the handle of the sound being first carried well forward between the legs. The shaft of the sound being steadied by the fingers of the other hand near the centre, so as to form a fulcrum, the handle is then gradually drawn back posteriorly, the sound forming a lever of the first order. The fundus is thus lifted away from the sacrum, care being taken to direct the uterus slightly to one side, so as to avoid the promontory of the sacrum. The intra-uterine portion of the sound being now made to revolve on its own axis by making the handle of the sound describe a large semicircle, the sound is pressed well backwards again and the uterus thus anteverted.

If much resistance be experienced, or pain produced, indicating the presence of adhesions, all further efforts at reduction should at once be abandoned, as otherwise the point of the sound may penetrate the uterus, and peritonitis ensue.

Sims's uterine repositr may be employed with safety in simple cases. The intra-uterine portion can be made to describe a half-

circle by withdrawing the stop-rod running through the shaft, which is projected by a concealed spring. All complicated instruments are liable, however, to get out of order, and encumber needlessly the armamentaria of the gynecologist. It possesses no special advantages over the sound in the hands of an experienced manipulator.

Having replaced the uterus in its normal position, our next object is to retain it there by some mechanical support until the uterine ligaments have recovered their tone and the natural supports are again available. Retroversion seldom occurs where the uterus is in a normal condition. There is generally some antecedent congestion, inflammation, or hypertrophy. The question will naturally arise, Shall we attempt to cure the coincident condition before replacing the uterus, or shall we replace the uterus first, and then endeavor to relieve congestion, etc.? As a general rule it will be found that by replacing the uterus in its normal position we facilitate treatment, and are more likely to be successful in curing the displacement as well as the condition which induced it. But should the uterus be too tender to tolerate a pessary sufficiently large to keep it in position, it may be necessary to resort to a preparatory course of treatment by the application of a few leeches; the employment of the syringe night and morning, with as hot water as can comfortably be borne; resort to the semi-prone or genu-pectoral position at frequent intervals; replacement of the uterus from time to time, and keeping it there by means of tampons of cotton-wool or oakum saturated with glycerin, medicated with iodine or carbolic acid, if thought desirable. A tampon, as large as a bantam's egg, is first pressed up in the posterior cul-de-sac behind the cervix. Another tampon is then placed below the cervix, and pushed up so as to elevate the uterus, and if possible, keep it slightly anteverted. Rest in the semi-prone position will favor this treatment, but the patient may be allowed to get up for a few hours each day. It will be necessary to change the tampons at least every other day.

In some cases a modification of Cutter's pessary, with a soft egg-sponge or inflated air-ball attached to the extremity in place of the bulb, will serve to maintain the uterus in position, and to lessen congestion, and enable a Hodge's pessary to be borne later on.

A Hodge's pessary, or some modification of it, even if the uterus be tender, will, however, generally be tolerated. Too large a one must not be employed at first, except in those cases where it is difficult to keep the uterus in place by a moderate-sized one, for fear of producing ulceration of the vagina by pressure. The instrument should be sufficiently long for the upper extremity

FIG. 75.



Sims's Uterine Repositor.

to pass well up the posterior cul-de-sac behind the cervix, while the lower extremity is concealed behind the arch of the pubes, no descending low enough to interfere with the urethra, but resting against the anterior wall of the vagina.

When an appropriate one is adjusted, the patient is often unconscious of its presence. Under no circumstances should it be retained if pain or discomfort be complained of. A smaller one should be inserted, or any local congestion or inflammation first relieved.

The variety of shapes of so-called Hodge's pessaries are innumerable, and vary frequently with each instrument-maker. The original closed lever pessary suggested by Professor Hodge (Fig. 76), consisted of a more or less square-shaped ring, having a considerable upper or sacral curve, and a very slight lower or pubic curve, with the corners well rounded, just sufficient to distribute the pressure equally over the anterior vaginal wall without encroaching upon the rami of the pubes. The lower end, thus resting behind and above the arch of the pubes, does not interfere with coitus.

In some cases the original Hodge's pessary is found to be too square-shaped, the pubic extremity pressing against the rami of the

FIG. 76.



Hodge's Pessary.

FIG. 77.



Albert Smith's Pessary.

pubes, and causing much discomfort. Under these circumstances the *Albert Smith Pessary* (Fig. 77), which is longer and more pointed at its lower extremity, rests between the rami of the pubes and is borne more readily.

Thomas's Retroversion Pessary is of somewhat similar shape, the upper or sacral end being very thick, so as to afford a broad base of support to the fundus. The lower end being curved well downwards, and pointed, rests between the rami of the pubes without interfering with the urethra, and thus prevents its rotation in the pelvis (Fig. 78).

The disadvantage possessed by all the modifications of Hodge's pessary having narrow pubic extremities, is that being wedge-shaped they are more likely to be driven out beyond the pubes. The pubic curve being increased also renders the pessary more liable to cause obstruction in married life.

Greenhalgh's Pessary (Fig. 79), where the bar in front is made of

soft india-rubber tubing, was intended to obviate this difficulty. Being made of elastic wire covered with india-rubber, the broad end can thus be compressed so as to facilitate its introduction, and when *in situ* offers little or no impediment to the introduction of the speculum or to coitus.

Practically, it will be found that when the tubing corresponding to the lower bar of the pessary becomes soft in the vagina, the corners occasionally press injuriously upon the tissues, and often cause ulceration.

The beneficial action of a Hodge's pessary is promoted by moderate exercise. The lower limb of the instrument being carried down as the anterior vaginal wall descends during the act of inspiration, the upper limb ascends in the posterior cul-de-sac, raising the fundus uteri and also pushing it forward. In time, it will

FIG. 78.



Thomas's Retroversion Pessary.

FIG. 79.



Greenhalgh's Pessary.

be found that the congestion usually accompanying retroversion diminishes as the uterus is kept in its proper position, and thus the tendency to retroversion is lessened.

The uterine ligaments meanwhile have an opportunity of recovering their tone, and if measures be adopted to improve the general health, as well as to relieve any local disorder, the patient will in time be enabled to dispense with wearing the support.

The bowels must be carefully regulated, so as to avoid all risk of accumulation of feces or the necessity for straining occurring. A little confection of senna, pulv. glycyrrhizæ co. (Ph. Pr.), Hunyadi's water, or other simple aperient, will often prove sufficient.

Any undue congestion of the uterus must be relieved by the application of a few leeches just after the menstrual period is over, or by puncturing the cervix with the lancet-shaped scarifier, or by the regular daily employment of the hot-water vaginal douche. The insertion of a plug of cotton-wool saturated in glycerin, medicated with tannin, alum, iodine, etc., if deemed requisite, will keep up a continuous drain, and so serve to deplete the uterus and lessen materially its bulk.

If there be abrasion or granular degeneration of the cervix, or cervical catarrh, these conditions must be relieved by appropriate treatment, such as the application of the nitrate of silver, carbolic acid, or other suitable agent. Astringent vaginal injections to strengthen the vagina will generally be needed. In any case, for

cleanliness' sake, it will be necessary to employ some form of vaginal injection as long as the patient continues to wear a pessary.

She should further be instructed not to pass water in the usual manner, sitting low on the chamber utensil, but to employ the night commode or w. c., so as to avoid any bearing down, which must inevitably happen when the patient squats in the way indicated.

In many cases of retroversion some form of Hodge's pessary is a *sine quâ non*, but it should not be regarded as the only expedient requisite.

Reclining in the semi-prone, or resorting to the knee-shoulder position from time to time, will assist the action of the pessary materially, and often enable a patient to tolerate it when otherwise it could not be done. Just before, during, and for some few days after each menstrual period, when the uterus is naturally heavier than usual, great care must be taken not to stand too long at a time, or to undertake any prolonged or severe exertion, the patient reclining whenever opportunity serves.

In some cases retroversion is complicated by prolapse of one or both ovaries in the posterior cul-de-sac of the vagina. They are often so tender as to effectually preclude any ordinary pessary being tolerated, so much discomfort, nausea, faintness, or intense agony being produced if a Hodge be inserted, that its immediate removal is necessitated. The postural treatment, in these cases, is often all that can be borne in the first instance. Local depletion by means of leeches may prove of service. The administration of scruple doses of the bromide of potassium, with or without belladonna, often relieves the ovarian congestion and renders the organ more tolerant of pressure.

Belladonna, or morphia and atropine pessaries, should be tried or they may be used as suppositories. If we can succeed in adjusting a Hodge's pessary so as to restore the fundus to a more natural position, the ovaries are then drawn up as well.

This may often be effected by employing a somewhat larger Hodge than would otherwise be prudent, so as to render the vagina tense, and enable the posterior limb to rest between the fundus and the ovary.

Greenhalgh's pessary (Fig. 79), reversed, the soft india-rubber tubing being placed posteriorly, behind the cervix, is sometimes tolerated in these cases, and may be tried.

If a little patience be exercised, and a few days' preliminary rest be enjoined, we shall generally be able to adjust some form of Hodge's pessary that will be tolerated.

Shultze's pessary, resembling a figure of eight doubled upon itself, the smaller loop encircling the cervix, is sometimes of service in these cases, especially if the posterior cul-de-sac be short, or the cervix be held forward by congenital shortness of the anterior vaginal wall.

Spiegelberg's pessary engages the cervix in a ring at the extremity of a retroversion pessary, forcing it backwards and up

wards. This may be accomplished also by merely arranging a cross-bar near the upper part of one of the retroversion pessaries.

Meigs's elastic ring pessary answers well in cases where very little pressure is exerted by the retroverted body, and where a certain amount of prolapsus also exists. Being elastic, it assumes any shape required by the pelvis, but it is more liable to cut through the vaginal walls than almost any other variety of pessary.

Where the uterus is so bulky, or the vagina so lax, that no form of internal support succeeds in keeping the uterus in position, Thomas's modification of Cutter's pessary, with a bulb sufficiently large to rest behind the displaced fundus and make this fall forwards by displacement and not by pressure, may be tried. It should be removed every night and reinserted every morning.

If the perineum be torn and rectocele be marked, it may be necessary to perform the operation of perineorrhaphy as indicated when speaking of prolapsus.

Retroflexion of the Uterus.

When the axis of the uterus is bent upon itself, the fundus being arched backwards, it is spoken of as retroflexion. There is generally a certain amount of retroversion associated with it, so that

FIG. 80.



Retroflexion of Uterus.

the cervix does not always retain its normal axis in the pelvis, but is tilted somewhat backwards, the os uteri looking forwards. In some cases of primary or congenital retroflexion the cervix is found to be just the reverse of this, being tilted forwards, the os looking backwards.

In recent cases the wall of the uterus on the convex side is thinned from stretching. In cases of long standing, however, the

tissues at the angle of flexion on the concave side are found to be attenuated. The explanation of this is that it may be due to some congenital defect of development either of the anterior or posterior wall. Or it may be due to the continuous pressure producing atrophy of the muscular tissue.

Retroflexion is more often met with than retroversion independently of prolapsus.

Causation.—Retroflexion occurs as a primary or congenital condition in some cases from defective development of the posterior uterine wall. No symptoms are developed, as a rule, until the time of puberty.

In by far the larger number of cases retroflexion is secondary or acquired, the result of abortion or parturition.

During the process of involution the tissues are soft and pliable the uterus is not only bulkier but also heavier, the uterine supports, including the vagina, lax and feeble. A certain amount of prolapsus with retroversion occurs, favored doubtless by the patient lying constantly on her back. The intestines descending in front of the fundus uteri tend, under the influence of the abdominal pressure, to push the fundus still further backward. Owing to the soft and pliable condition of the tissues retroflexion is thus readily produced. The presence of any clot within the uterus retards involution, and often excites expulsive efforts. The abdominal muscles being thus called into play press the intestine down upon the anterior wall of the uterus, causing an increased amount of retroversion and ultimately retroflexion. A fibroid tumor of the posterior uterine wall has a similar effect in producing retroflexion. The pressure of an ovarian tumor may produce retroflexion in some cases.

Symptoms.—Retroflexion generally produces a much greater amount of discomfort than occurs in cases of retroversion. In consequence of the vessels being bent at a more or less acute angle venous congestion almost invariably ensues. The natural result of this is that leucorrhœa, menorrhagia, and metrorrhagia are prominent symptoms. Owing to the cervical canal being constricted at the seat of flexion, the escape of the menstrual and mucous secretions is impeded, giving rise to dysmenorrhœa, or uterine colic and tenesmus.

The retroflexed fundus pressing backwards interferes with the calibre of the rectum; the passage of hardened feces over the tender and often inflamed fundus causes so much pain and distress that the patient instinctively postpones the act of defæcation for as long a time as possible. The straining efforts to overcome the obstruction increase the congestion as well as the flexion. In some cases the fundus acts like a ball-valve, almost occluding the bowel, the feces being flattened or ribbon-like. Obstinate constipation thus results, often associated with an increased secretion of slimy mucus from the rectum, together with tenesmus and sense of bearing down.

Dyspareunia, or pain on coitus, results not only from mechanical

violence applied to the flexed and congested fundus, but also to the ovaries, which are often prolapsed and congested as well.

Localized pain in the sacral region is generally present, increased on defæcation, and also by standing or walking. Just preceding the menstrual flow, the pain is often spoken of as agonizing and almost unbearable, extending down the thighs, radiating to the groins, and producing considerable malaise. The pain in the lower part of the spine is sometimes so intense and persistent as to lead to the idea that spinal disease exists. Tenderness on pressure over one fixed spot, a sense of numbness or want of power, especially of inability to walk, and even in extreme cases, paraplegia, all tend to confirm the supposition that spinal disease is present. In former years many patients were confined to bed or the couch, made to recline on bare boards, cupped, blistered, and otherwise actively treated for supposed spinal complaints, due in reality to symptomatic disturbance from a retroflexed uterus.

Reflex nervous manifestations are often well marked. "The nervous centres respond to the slightest impressions. Hysteria breaks out in all its manifold eccentricities; neuralgia appears in one or more of its various forms, as sciatica, lumbago, tic-douloureux; rheumatism, headache, and a disposition to vertigo or syncope frequently recur; emotional, moral, and intellectual disturbance, as manifested in irritability, despondency, melancholy, loss of command over feeling and thought, are often developed. The congested displaced organ is a constant source of nervous irritation and exhaustion; it is constantly pressing upon the sacral plexus; it is constantly sending painful impressions to the nervous centres; constantly using up in a morbid direction the nerve-force which is wanted for the performance of healthy function." (Barnes.)

Results.—In addition to dysmenorrhœa, endometritis from retention of the secretions setting up irritation is not infrequent. The obstruction to the normal circulation induces congestion, which is still further increased by the obstruction to the escape of the secretions. The uterine contractions excited to expel the retained secretions produce retrograde dilatation of the Fallopian tubes, and not infrequently reflux of the menstrual fluid occurs, and peritonitis is set up in consequence. The walls of the uterus become hypertrophied from the contractions excited to overcome the obstruction, and thus the bulk of the uterus in time is greatly increased.

In some cases an accumulation of mucus takes place in the uterus, which at length gives rise to efforts at expulsion attended by severe colic. This is often spoken of by the patient as "gathering" in the womb, which bursts and gives vent to a quantity of discharge. It is the condition described as hydrometra.

Sterility is not infrequent, but is less common than in cases of ante flexion. Should pregnancy occur when the uterus is retroflexed, or retroflexion take place during the early months of uterogestation, and the uterus become impacted in the pelvis, the fundus

being incarcerated below the promontory of the sacrum, abortion almost invariably occurs. The fact of frequent miscarriages at the third or fourth month should always lead to a careful examination as to the position of the uterus. If retention of urine occur about this period it will generally be found to be due to retroflexion.

The obstinate constipation resulting from the pressure of the retroflexed fundus upon the rectum, in time leads to considerable disturbance of the digestive functions; flatulent distention of the intestines, nausea, anorexia, headache, and other symptoms of dyspepsia occur. "Copræmia" is the term Dr. Barnes suggests for the form of blood-poisoning produced by absorption of some of the elements of decomposition resulting from retention of the excreta in the large intestine, as evidenced by the sallow, dirty hue of the skin, and the unpleasant exhalations from it.

Diagnosis.—On vaginal examination with the finger, the cervix is not infrequently found to occupy nearly its normal position in the centre of the pelvis, the os uteri looking downwards in the axis of the vagina instead of pointing somewhat backwards, as occurs when the uterus is in a normal state, or forwards as met with in cases of retroversion.

On carrying the finger in front of the cervix, there is an absence of the usual resistance, due to the presence of the body of the uterus, whereas on sweeping the finger round to the posterior cul-de-sac, it detects a firm, globular, uniform rounded tumor continuous with the ridge of the cervix, but with a distinct sulcus or concavity between the two. This is the retroflexed fundus. It may be felt to move conjointly with the cervix. If the abdominal walls be moderately lax and not over-rigid or thickened by the presence of adipose tissue, and there be no ovarian tumor or inflammatory swelling to interfere with bimanual examination, we shall be able to detect the absence of the fundus from its normal position. This examination should always be made with the patient lying on her back, the knees well drawn up.

Rectal examination by means of the finger will generally enable us to map out more carefully the displaced fundus than was possible per vaginam. This may also be combined with the bimanual examination, when the contour of the uterus can often be accurately determined. Should any doubt still remain as to the presence of a retroflexion, it may be necessary to employ the uterine sound. This should not, however, be passed as a mere matter of routine, for if the uterus be inflamed as well as flexed, a considerable amount of pain may be caused and the symptoms much aggravated, and if there be the least probability of pregnancy existing, the use of the sound is counter-indicated. Acquired sterility is the rule in these cases, so that if the menstrual period has been regular, even though the bulk of the uterus be greater than normal, the presumption is that pregnancy does not exist.

In cases of primary or congenital retroflexion, the os uteri is often found to be very small, and tilted more forwards than is usually the case in acquired retroflexion.

Having bent the sound to a curve corresponding to that of the uterine axis, as ascertained by previous examination, the patient lying in the left lateral or semi-prone position, the point is introduced within the cervix, with the concavity forward, as far as the internal os if possible. The handle of the sound is then made to describe the arc of a large circle, the intra-uterine portion revolving almost on its own axis, so that the point of the sound is directed backwards. If the handle be now carried well forwards, whilst the finger in the vagina presses up the retroflexed fundus, the sound will generally enter without difficulty, and the point may be pushed in a backward and downward direction until it reaches the fundus, where it may be felt by the examining finger.

To ascertain whether the fundus be mobile the handle of the sound is now pressed gently in a backward direction so as to raise the fundus. If no adhesions exist this will readily be accomplished. The handle of the sound is then again made to describe the arc of a large circle, so as to bring the concavity forwards by what is termed the *tour-de-mâitre*, in a similar manner to passing a silver catheter under the pubic arch. The handle being then pressed backwards, the point of the sound carries the fundus forwards into the position of anteversion. The fundus may now be detected by conjoined manipulation to be in its normal position, and the tumor that was originally felt posterior to the cervix to have disappeared.

In effecting this reduction of the displaced fundus, care must be taken to direct it to the left of the promontory of the sacrum, especially if the uterus be enlarged and tender. This is done by directing the point of the sound in a proper direction, assisted by the finger.

Differentiation.—The conditions most liable to be confounded with retroflexion of the uterus are a small fibroid tumor in the posterior wall of the uterus, retro-uterine hæmatocele or pelvic cellulitis, prolapsed and enlarged ovary, and accumulation of fæces.

The detection of the fundus uteri behind the symphysis pubis by conjoined manipulation, the passage of the uterine sound in the normal direction, the tumor behind the cervix being still felt by the finger, will serve to distinguish a fibroid from retroflexion. The same remarks apply to the other conditions. In addition, the history and other prominent symptoms will assist us in forming a diagnosis. In retro-uterine hæmatocele the uterus is pushed forwards behind the pubes, the cervix being more or less compressed.

In cellulitis the swelling is not only felt posteriorly, but generally surrounds the uterus, fixing it in the pelvis. The history of its invasion, mostly following parturition, the febrile disturbance, pain, etc., will point clearly to the nature of the affection.

Prolapse of a moderately enlarged and inflamed ovary, where intercurrent pelvic peritonitis has caused adhesions fixing the ovary behind the uterus, is sometimes very difficult to distinguish from a retroflexed fundus at first. The passage of the uterine sound in the normal direction, and the somewhat elastic, tense, semi-fluctuating feel of the ovary, serve to distinguish it from retroflexion on the one hand, or from a small fibroid on the other.

Accumulation of feces may mislead the unwary; an examination per rectum will at once disclose the nature of the affection.

A movable kidney has been known to descend into the pelvic cavity, behind the uterus, and might occasion some difficulty in diagnosis. It is, however, a very rare complication, the mere mention of which will be sufficient to place us on our guard.

Treatment.—Our first object will generally be to replace the uterus and endeavor to restore the continuity of the axes of the uterine and cervical canals, so that the secretions from the body of the uterus may gain ready exit through the cervix.

If, as frequently happens, the uterus is not only retroflexed but also enlarged, inflamed, and tender, the patient experiencing much discomfort on even a digital examination, it will be better to enjoin a few days' rest in bed before commencing active treatment. The patient, however, must be instructed not to remain constantly lying on her back, but on her left side in the semi-prone position, the left arm being brought out behind the back, the body turned over on the chest, the head low, the knees drawn up towards the abdomen, as indicated when describing the employment of Sims's speculum.

This posture alone favors the return of the fundus to a more normal position. If in addition to this the index-finger be employed to press the fundus gently forwards and downwards so as to sweep it under the promontory of the sacrum, taking the opportunity of allowing air to enter the vagina by pressing the posterior wall of the vagina well backwards, the uterus will thus be replaced, although the flexion will not be straightened out.

Where the uterus is very much increased in bulk, it may be necessary to resort to the knee-shoulder posture, as indicated when speaking of the treatment of retroversion. The pressure of the abdominal organs is thus removed. The draught of the viscera falling forwards and downwards, exerts a suction force, which, when air is admitted by the vagina, secures the effect of atmospheric pressure and allows the influence of gravity to come into play, so that we get what Campbell describes as pneumatic self-replacement of the uterus.

Having reduced the dislocation of the uterus in this way, the patient should let herself gently down into the semi-prone posture and remain there as long as may be convenient.

If deemed requisite, a few leeches may be applied from time to time, or blood abstracted from the cervix by puncturing with the scarifier. Depletion of the swollen organ will still further be encouraged by the injection of hot water per vaginam, and the subsequent insertion of plugs of cotton-wool saturated in glycerin.

The engorgement of the uterus being thus materially diminished, with the diminution of bulk we get also a corresponding improvement as regards the flexion. Pressure being removed from the rectum, the bowels are thus enabled to act without pain or straining, and thus an important symptom—obstinate constipation—is not only removed, but the evil effects of straining and the passage

of hardened fæces over the inflamed organ avoided. If necessary, the action of the bowels may be assisted by means of small enemata, or saline or other simple aperients.

Having thus relieved the painful inflammatory condition of the uterus by these means, a Hodge's pessary, carefully adjusted to meet the requirements of the individual case, may now be tried. The mode of introduction has been already described.

The great advantage of this form of pessary is that the posterior limb stretches the posterior vaginal cul-de-sac backwards and upwards, tilting the fundus forwards and drawing the cervix backwards, so that the patient can be allowed to get up. The weight of the uterus itself, in the standing position, tends to remedy and not to aggravate the displacement, and the intestines, being again enabled to descend into the retro-uterine fossa, press upon the posterior surface of the uterus, and thus tend gradually to reduce the retroflexion. The patient should not be allowed to stand or walk too much for some little time after the introduction of the pessary.

In selecting a Hodge, our choice should be guided by the capacity and tonicity of the vagina, the bulk or tenderness of the uterus, the presence or absence of a prolapsed ovary, and the experience gained in each individual case as to the tolerance of a foreign body in the vagina. A moderate-sized one, with a well-marked posterior curve, that reaches well up behind the cervix, should first be tried. The patient should rest up from time to time and be seen daily, until we are satisfied that it fits properly and does not press unduly on the soft parts. The vagina should be syringed out once or twice a day with some appropriate lotion as long as the instrument is retained. It may be worn for several consecutive months without removal, as long as opportunity be taken, now and again, to examine carefully in order to ascertain that it is not setting up any mischief. It does not interfere with coitus if properly adjusted; in fact, impregnation is more likely to occur whilst the instrument is being worn than it was before. Should conception occur, frequent resort to the semi-prone or genu-pectoral position should be enjoined until the uterus has risen above the pelvic brim, which occurs about the fourth month, when the Hodge may be removed. The risk of abortion or of impaction of the gravid uterus in the pelvis is thus materially lessened. A difficulty not infrequently experienced is that the posterior limb of the Hodge fits into the concavity caused by the retroflexion of the uterus, the fundus remaining flexed over the pessary. In other cases the pessary, although it does not raise the fundus, still causes so much distress from pressure upon it, that it will be requisite to remove the pessary until the congestion of the uterus has been relieved and the beneficial effects of postural treatment have rendered the uterus less sensitive. In each of these cases some little care will be required in finding an appropriate-shaped Hodge. Sometimes we find that one which stretches the vagina tightly causes less irritation than another which apparently is a much better fit. The posterior limb should be sufficiently bulky not to fit into the angle of flexion, as in *Thomas's Retroflexion*

Pessary (Fig. 82). Occasionally a Hodge, with india-rubber tubing in place of the solid posterior limb, will be tolerated with less inconvenience than an ordinary Hodge. Even the same instrument differently shaped will sometimes make a great difference as regards the comfort with which it is worn.

Frequent resort to the semi-prone or knee-shoulder posture, injection of hot water, regulation of the bowels, rest at the menstrual epochs, and avoidance of all causes of excitement or fatigue, should still be observed.

Any granular degeneration of the cervical mucous membrane or endometritis, should be treated by appropriate remedies, so as to remove all sources of irritation. Tampons of oakum or cotton-wool saturated with glycerin, or with carbolized or iodized glycerin, may still be employed to lessen the bulk of the uterus.

The employment of skirt-supporters or garment-suspenders, the avoidance of tight-lacing, lifting heavy weights, or prolonged exertion, should be insisted upon, and every other precaution taken to aid the mechanical treatment.

FIG. 81.



Hodge's Pessary for Retroversion.

FIG. 82.



Thomas's Retroflexion Pessary.

Medical treatment should not be forgotten, but carried out conjointly with surgical aid.

In many of the cases of acute retroflexion associated with metritis, the administration of the liquor. hyd. perchlor $\mathfrak{z}\text{j}$, pot. iod. gr. ijj-v , tinct. nucis vom. $\mathfrak{m}\text{x}$, tinct. cinch. co. $\mathfrak{m}\text{xx}$, with inf. aur. co. or aqu. chlorof. proves very beneficial. In others a combination of the pot. bromid. gr. x-xx , with ext. ergot. liq. $\mathfrak{m}\text{xv-xx}$, and cinchona, serves to allay the nervous disturbance and reduce the bulk of the uterus. Iron, as a rule, should not be given, as it tends to increase the congestion of the uterus and produce constipation. But where the patient is very anæmic from the menorrhagia, and the uterus has been restored to its proper position and the congestion diminished, some of the lighter forms, such as the acetate, citrate, phosphate, or tartrate may be given, or the arseniate, saccharated, carbonate, iodide, or reduced iron, if preferred.

Local pain or discomfort may be relieved by means of morphia, morphia and atropine, conium, belladonna, or other form of suppository or pessary. A small enema of starch and laudanum often proves as efficacious as anything.

Posture should always be tried first. Dull, heavy, aching pain

in the back or sacrum, with sense of dragging, bearing down, or other form of discomfort, may often be effectually relieved by resorting to the genu-pectoral or semi-prone position. This especially applies to cases where distress is complained of after insertion of a Hodge's pessary.

Primary or congenital retroflexion is commonly associated with stenosis of the external os uteri. This in single women aggravates considerably the dysmenorrhœa, and in married patients conduces to the production of dyspareunia and sterility. Bilateral incision of the cervix is generally indicated, and should be performed in the manner described when speaking of malformations of the uterus. The treatment for the flexion will be similar to that suggested for the secondary form: posture, replacement, a Hodge's pessary, etc.

Cutter's *Pessary for Retroflexion* (Fig. 83), as modified by Thomas, may sometimes be found of service in cases where the vagina is so relaxed that an ordinary Hodge cannot be retained, or where the posterior cul-de-sac is very shallow. The curved stem passes over the perineum, and is attached to a waistband. It is less dangerous than any of the forms of intra-uterine stems connected with external supports, but is still not free from risk, in that shocks are readily communicated to the fundus when the patient sits down, or from jolting in driving, etc.

Some care will be needed in teaching the patient how to insert it, so that the upper portion passes behind the cervix. It should be removed at bedtime and replaced in the morning.

After wearing one of these for a few weeks, the posterior cul-de-sac often becomes sufficiently stretched to allow of a Hodge being retained *in situ*.

Intra-Uterine Pessaries or stems will rarely be required in cases of retroflexion, if only a moderate amount of skill and patience be exercised in carrying out the indications suggested.

Still there will occasionally be found cases so intractable, more especially of the congenital form, where the os is very small, the vaginal cervix so short, the posterior cul-de-sac so shallow, or the vagina so lax, that an ordinary Hodge's pessary cannot be retained, and the flexion persists, spite of all our efforts to the contrary.

As we have considered at length the indications for the employment of intra-uterine stems, the precautions requisite to be observed, and other matters pertaining to this subject, when speaking of antelexion, the reader is referred to this for further details.

FIG. 83.



Thomas's Modification of Cutter's Pessary.

A simple vulcanite or silver stem, or a self-retaining one, such as Wright's, or Chambers's modification of it, may be inserted, and thus convert a case of retroflexion into one of retroversion. If a Hodge's lever pessary be now introduced, the fundus will be carried upwards and forwards. Both the flexion and version are thus overcome, without exposing the patient to unnecessary risk, as too often happens when the intra-uterine stem forms part of a vaginal or external pessary.

FIG. 84.



Meadows's Vulcanite Stem and Support.

Numerous ingenious contrivances have been devised to overcome the difficulty often experienced of keeping the uterus straight and the fundus elevated. *Meadows's Vulcanite Stem and Support* (Fig. 84) consists of an intra-uterine stem attached to a kind of Hodge's pessary. To insert it the stem can be drawn down in a line with the Hodge, and is fitted on to a long probe or sound, which guides the stem into the uterus. On withdrawal of the sound, the elastic band pulls the stem at right

angles to the pessary, elevating and straightening the body of the uterus. The rounded extremity of the vaginal pessary is directed backwards towards the sacrum. The patient should be carefully watched whilst wearing it, lest mischief arise from undue pressure. To withdraw it the finger must be passed into the rounded extremity, and traction exerted downwards.

CHAPTER VII.

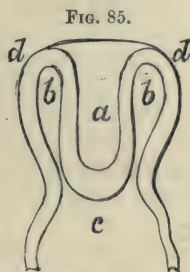
DISPLACEMENTS OF THE UTERUS—*continued.**Inversion of the Uterus.*

Inversion.—This form of displacement is fortunately not of frequent occurrence. When complete, the uterus is simply turned inside out, so that the inner surface becomes the outer, the normal intra-uterine cavity disappearing and another cavity forming above from depression of the fundus, so that the external surface of the normal uterus becomes the internal surface of the inverted uterus.

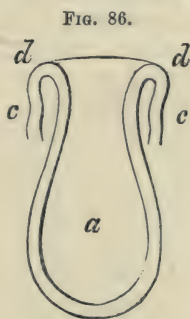
The cavity above contains a portion of the Fallopian tubes and of the round ligaments, which are dragged in by the descent of the fundus uteri. In cases of acute inversion following parturition, the ovaries may be drawn into the cavity and even coils of intestine; but after involution of the uterus has taken place and the case becomes chronic, this complication is not met with.

Varieties.—The displacement may be either partial or complete. Crosse speaks of three degrees.

1. *Depression*, where the fundus or placental site falls inwards, projecting in the cavity of the uterus.
2. *Introversion* or intussusception, the fundus not reaching beyond the os uteri (Fig. 85).
3. *Perversion*, where the fundus passes through the os uteri (Fig. 86), the cervix and os being inverted in extreme cases, so that not even a groove remains between the inverted cervix and the vaginal



INTROVERSION.



PERVERSION.

Illustrating the Degrees of Inversion of the Uterus. (From CROSSE.) *a.* The Inverted Fundus. *b.* The Natural Cavity. *c.* The Vagina. *d.* The Upper Margin of the Cup formed by the Inverted Fundus Uteri.

vault. This condition may be complicated by extrusion of the inverted fundus beyond the vulva.

Inversion may be acute or chronic, or sudden or gradual. The acute form, where the fundus becomes rapidly inverted at the time

of parturition, ends with the completion of involution of the uterus, and belongs more to obstetrics. The chronic form dating from the completion of involution, or occurring independently of parturition, is that which will be considered now.

Causation.—In order that inversion can take place, there must be relaxation and inertia of the uterine walls, with considerable enlargement of the cavity combined with downward traction or pressure on the fundus. At the time of parturition, traction upon the funis when the placenta is adherent, or immoderate pressure upon the fundus uteri by the hand externally, through the abdominal walls, or the mere weight of the placenta itself, will generally be found to be the exciting cause. When the uterus is relaxed, as occurs shortly after parturition, the mere act of sneezing, coughing, or any muscular effort, may be sufficient to produce inversion.

In the non-puerperal state, the presence of a submucous fibroid or fibroid polypus may exert traction upon the fundus, depressing this until the uterus, stimulated by the foreign body, endeavors to expel this, and so causes a still greater amount of inversion.

Symptoms.—When acute or sudden inversion occurs at the time of parturition, there is generally evidence of severe shock with collapse, alarming distress, vomiting, clammy sweats, restlessness, frequently attended by sudden and profuse hæmorrhage with a sensation as of “her inside coming out.” The uterus is discovered occupying the vagina, or even protruded beyond the vulva, covered by the placenta.

If the nature of the case be not discovered at the time, the process of involution may occur, the uterus gradually diminishing in size until it retreats within the vagina, and it then constitutes chronic inversion.

The symptoms of chronic inversion are menorrhagia, or more or less constant hæmorrhage mucopurulent leucorrhœa, dragging pains in the back and loins, rectal or vesical tenesmus, bearing down, difficulty in locomotion, and a general state of anæmia.

Results.—As long as the tumor remains within the vagina, it generally gives rise to explosive efforts. The inverted mucous membrane becomes inflamed or even abraded, profuse leucorrhœal discharge and often hæmorrhage resulting. When forced beyond the vulva, chronic inflammation with induration of the parts ensues, the surface becomes dry from exposure, often ulcerated, and occasionally sloughing of the mass ensues.

With the progressive senile atrophy which occurs after the climacteric period, all acute symptoms may subside and toleration become established.

Diagnosis.—This is not so easy as at first sight might appear. The recently inverted uterus has been torn away by the attendant, and even forceps applied to drag it away on the supposition that it was the head of a second fœtus. In the chronic stage, when the inversion is more or less complete, it has frequently been mistaken for a polypus and removal attempted.

In recent or acute inversion, the history of sudden shock or collapse following parturition, the presence of the uterus at or beyond the vulva, the absence of the fundus behind the pubes, the detection of a circular ring or pit in place of the firm round ball usually felt, will generally indicate the nature of the case. The inverted uterus, about the size of a foetal head, is painful to the touch, has a vascular velvety surface, bleeding readily on the slightest touch; alternate contractions and relaxations may frequently be noted, inducing characteristic changes of size and consistence, such as can only occur in the case of the uterus.

In the chronic stage, the following are the points of difference between polypus and inversion :

Polypus.

The uterine sound passes $2\frac{1}{2}$ inches or more beyond the edge of the cervix.

FIG. 87.



Polypus.

Tumor pyriform in shape, neck narrow.

Size varies much.

No cords felt.

On conjoined manipulation, fundus uteri detected.

On rectal examination, finger reaches only up to body of uterus; the fundus can be felt by pressing over lower abdomen.

Growth non-sensitive, even on rough manipulation; may be removed without causing pain.

Inversion.

Sound seldom passes beyond an inch, generally arrested at neck.

FIG. 88.



Inversion.

Tumor flattened anteriorly and posteriorly, largest point is lowest, neck comparatively large, encircled by a thickened ring or ridge if inversion complete.

Size scarcely larger, and often smaller, than in natural state.

The stretched round ligaments may be felt within the tumor.

A cup-shaped depression or ring detected if abdominal walls lax.

Finger can be passed above the tumor.

Tumor very sensitive, especially if a ligature be applied to its neck with a view to removal.

By introducing a male catheter into the bladder and directing its end downwards and backwards, in case of inversion the point, carrying the coats of the bladder before it, will enter the peritoneal cul-de-sac formed by the inversion, and be felt by the finger in the vagina through the coats of the inverted organ. Again, by a similar method, the end of the catheter may be directed backwards, so as to bring it to project in the rectum, where a finger will feel it with only the coats of the rectum and bladder intervening in case of inversion; but if the firm-resisting uterus be there, as in case of polypus, the end of the catheter will not be felt.

If doubt as to the nature of the vaginal tumor still exists, anaesthesia may be produced, and rectal exploration by insertion of the hand carried out, so as to map out the contour of the uterus.

In rare instances adhesion between the pedicle of a polypus and the cervical canal may take place, preventing the passage of the sound, and so leading to the belief of inversion being present.

When inversion is produced by a polypus attached near the fundus, it may be exceedingly difficult to diagnose the complication, or to decide where the polypus commences and the uterine wall ends.

Partial or incomplete inversion may be difficult to diagnose from a submucous fibroid growth. Attention to the following points will generally enable a diagnosis to be made:

Fibroid.

Sound passes normal length or even more.

FIG. 89.



Submucous Fibroid of Uterus.

Conjoined manipulation detects fundus uteri in normal position and of normal shape.

Growth insensible to touch.

History of gradual development.

May occur in nullipara.

Inversion.

Sound passes less than normal distance.

FIG. 90.



Partial Inversion of Uterus.

Depression of fundus detected, on conjoined manipulation.

Tumor sensitive to touch.

More sudden development.

Generally follows parturition.

From prolapsus uteri inversion may readily be distinguished by the os uteri being detected at the lowest point of the tumor, through which the uterine sound may be passed the normal distance or more in case of prolapsus.

Prognosis.—This is at all times serious. One-third of the cases reported have proved fatal within one month. Death may result from prolonged hæmorrhage, exhaustion, sloughing, or gangrene.

The difficulty of forming a correct diagnosis is an element of danger; rupture of the vagina from forcible attempts at reduction is another; and removal by the *écraseur*, on the supposition that the tumor is a polypus, is also to be borne in mind.

Owing to the improved methods of treatment lately devised for the relief of inversion, a much more favorable expectation of reduction, with a corresponding decrease in the mortality, may fairly be looked forward to.

Treatment.—If acute inversion occur immediately or shortly after labor, the placenta remaining attached, peel this off rapidly but carefully, apply counterpressure above the pubes to avoid rupturing the vagina, then press the fist or the fingers formed into a cone upon the lowest portion of the fundus, and press steadily upwards, backwards, and to one side, so as to avoid the sacral promontory.

Where uterine action is present and the cervix and os are constringing the inverted portion, we must then endeavor to replace that part first which came down last, by grasping the upper portion of the mass and pressing steadily upwards, forwards, and to one side.

Chloroform may be administered if uterine action be strong, and the patient should be placed in the semi-prone position. It will be useless now endeavoring to indent the fundus, as we thereby double the thickness of the uterine wall that has to be passed through the constriction.

In chronic inversion, where the process of involution has been completed, we must not attempt immediate reduction by forcible taxis, or we shall run great risk of rupturing the vagina. Prolonged elastic pressure by suitable mechanical contrivances must now be tried. This may be combined with the taxis at appropriate intervals, or to complete the reduction.

An air-ball pessary inflated and passed into the vagina supported by a perineal bandage, may first be tried. Where this fails, or only partially succeeds, efforts at digital compression, for short intervals at a time, may be resorted to, continuous elastic pressure being persevered with steadily in the meantime.

The most ingenious and successful apparatus is *Aveling's Uterine Repositor* (Fig. 91) with a compensating perineal, and a pelvic curve. The cup-shaped disk is applied to the inverted fundus, the lower end of the repositor is secured by four elastic bands which are attached to a waist-belt, held in place by shoulder-straps. The amount and direction of the pressure are regulated by adjusting the straps, the fundus being pressed upwards and forwards in a direct line with the axis of the uterus and the pelvic inlet.

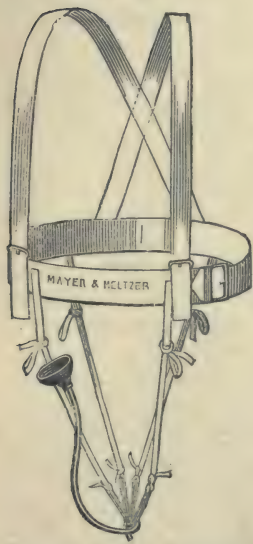
When reduction has been partially accomplished by this process, a smaller disk must be applied which will pass readily through the os uteri.

It is better to keep the patient in bed, and if much distress be occasioned, employ morphia injections subcutaneously, or morphia

suppositories, to enable her to tolerate the pressure. Reduction is usually accomplished within forty-eight hours.

Pressure may also be applied by means of a vaginal stem with a cup- or bulb-shaped extremity, to which a small india-rubber disk pessary has been cemented, similar to those employed in cases of procidentia. A Cutter's pessary answers the purpose. An ordinary stethoscope with a perineal band to support it may be employed if no other suitable instrument be at hand.

FIG. 91.



Aveling's Uterine Repositor.

Dr. Barnes has devised an elastic pessary consisting of a fixed stem made to fit the pelvic curve and surmounted with a cup-shaped disk of hollow rubber which receives the inverted uterus.

Strong rubber bands are attached to the end of the stem which projects beyond the vulva, similar to Aveling's (Fig. 91). These bands can be tightened or relaxed so as to regulate the pressure to a nicety and give in the exact direction required. Counterpressure is exerted by pads applied to the abdomen, supported by a firm binder.

Once a day, or every other day, the instrument may be removed, and under chloroform, an attempt at reduction by taxis be made until fatigue or the condition of the patient warn us to desist when the elastic pessary is readjusted.

During all this time the patient must be watched, and care taken that the sustained elastic pressure does not occasion unusual distress. At times this is severe, and may necessitate intermitting our efforts, or resorting to chloral or morphia hypodermically to allay the pain produced. In many instances of long standing we shall need to persevere steadily for many successive days; as many as eighteen have been necessary.

Reduction often takes place suddenly with a jerk at last. Adhesions are extremely rare, and for all practical purposes the possibility of their presence may be ignored.

Where constriction of the external os offers considerable resistance to attempts at reduction, the method of Dr. Hicks may be tried. This consists in distending the vaginal vault by means of a hollow annular elastic pessary, used in conjunction with direct pressure on the fundus, so as to stretch open the os.

Dr. Noeggerath suggests compressing the uterine body opposite to each horn by means of the finger, so as to indent one of these and thus offer to the cervical canal a wedge, which passes up and is followed rapidly by the other horn, and the whole body. This method is specially applicable when the fundus has been carried up within the os but resists further reduction.

Dr. Barnes, after trying continuous elastic pressure with occasional attempts by taxis, draws down the tumor to the vulva by passing a sling noose of tape round it, thus putting the neck on the stretch, then makes two incisions about a third of an inch deep, one on each side, in a longitudinal direction across the fibres of the cervical sphincter. Then compressing the uterus with the left hand, and supporting the os uteri by the fingers of the right hand, through the abdominal wall, the uterus is replaced. He suggests that this method should only be resorted to after a full trial of continual elastic pressure with occasional attempts by taxis, and that the reinversion should be trusted to sustained elastic pressure.

In practice it will be found that this latter process, if only properly directed, is sufficient to overcome the most chronic inversion. Dr. Aveling's double-curved uterine repositor has proved most satisfactory, and should always be employed.

Forcible taxis, by endeavoring to overcome resistance by sheer force rapidly applied, is attended by far too great risk to be considered as a justifiable operation in the majority of instances.

It is impossible to restrict the amount of force within safe limits, and the parts will not sustain more than a certain amount of violence without laceration. Death has frequently resulted from a resort to this method. The experience of late years as to the safety and efficacy of persistent elastic pressure should encourage us to confine our efforts to wearing out resistance by gentle, long-sustained pressure, and not to attempt forcible reduction.

Barrier effected reduction by grasping the inverted uterus in the hand, pressing the thumb against the fundus, and forcing the neck against the curve of the sacrum as a point of resistance.

Courty recommended passing two fingers up the rectum, dipping them into the cervical ring, and thus gaining a point of resistance.

Thomas has twice tried opening the abdomen, dilating the cervix from above, by a kind of glove-stretcher, and reinverting the fundus; but the operation seems to be more dangerous even than amputation, and at present can scarcely be recommended.

White constructed a uterine repositor having a spiral spring of steel wire at the outer end. The uterine extremity is expanded and hollowed to receive the fundus, and is tipped with soft rubber. This is supported on a stem of wood slightly curved.

The hand being passed into the vagina, the uterine cup of the repositor is then adapted to the fundus, where it is held by the hand. The spring is then placed against the breast of the operator, keeping up a pressure of eight or ten pounds. Counterpressure to prevent too great strain upon the vagina is made by the hand outside, so that the fingers dip into the inverted uterus.

Amputation of the inverted uterus has been recommended and practised, but cannot be regarded as a scientific proceeding, nor with the improved methods of accomplishing reduction by means of continuous elastic pressure, can it now be regarded as a justifiable proceeding except in very rare cases where efforts at reduction

have been tried by some competent operator and failed, and the patient's life is threatened.

The operation itself is attended by risk, first of hæmorrhage then of shock, and as a direct communication is established with the peritoneal cavity, acute peritonitis is not infrequent. It should never be undertaken until return of the displacement has been proved to be impossible, nor even then unless every appliance with competent assistance be at hand in the event of hæmorrhage occurring.

Having drawn down the tumor and passed a ligature through the base so as to retain full control over the stump, the galvanic or the wire *écraseur* is then applied and gradually tightened until the lower portion is removed. If hæmorrhage occur this must be arrested by the actual cautery, styptics, or sutures passed through the divided edges of the cervix so as to secure the bleeding vessels.

M'Clintock has tried strangulating the neck by means of a ligature, left on for a few days, and then removing the uterus below by the chain *écraseur*; this lessens the risk of hæmorrhage considerably, and is a mode of operation which may safely be recommended.

Where reduction cannot be accomplished, and amputation is not resorted to for various reasons, we may be called upon to arrest the hæmorrhage that is generally the chief symptom. This may best be done by steeping a narrow bandage, half an inch broad, in some strong styptic solution, such as alum 1 in 12, sulphate of zinc 1 in 2, perchloride or persulphate of iron 1 in 2; tannin 1 in 4 (glycerin); and then wrapping it tightly round the inverted organ. If this remain within the vagina, strong astringent injections may be employed. If this be insufficient, the surface may be painted over with the solid nitrate of silver, strong carbolic acid, potassium fusa, or the actual cautery, so as to alter profoundly the structure of the mucous membrane and restrain further hæmorrhage.

CHAPTER VIII.

MENSTRUATION AND VASCULAR DISORDERS OF THE UTERUS.

BEFORE entering upon the consideration of the vascular disorders of the uterus, it is essential to understand the normal functions of the organ.

Menstruation.—Menstruation consists in a periodic discharge of a sanguineous fluid from the mucous membrane lining the body of the uterus, recurring at regular intervals of about a month, during the period of sexual activity in women, except during pregnancy and lactation.

The terms *catamenia*, the name given by Aristotle, the monthly period, the *menses*, the courses, etc., are also employed to designate the menstrual flow. The flow has been regarded as a secretion and as a simple hæmorrhage. It is, however, a secretion only in so far as it contains mucus, and it is something more than a simple hæmorrhage. According to John Williams, immediately before menstruation is about to take place, the inner surface of the body of the uterus is found to be soft, pulpy, and swollen. This is due to the presence of a membrane known as the *decidua menstrualis*, lining the cavity. The decidua just before menstruation is pulpy in consistence. It is applied directly to the muscular wall of the uterus, without the intervention of a layer of connective tissue, though there is an abrupt distinction between the two at their line of union.

The decidua is thickest at the fundus and the upper parts of the anterior and posterior walls of the uterus, where it measures one-fourth of an inch, and sometimes more, in depth; it is thinnest along the borders of the organ, in the cornua, and just above the *os internum*. It is composed of a superficial layer of columnar epithelium, tubular glands lined by ciliated columnar epithelium, blood-vessels, nerves, and lymphatics, embedded in a soft tissue, which again is formed of round and fusiform cells lying in a transparent structureless matrix. The glands do not terminate at the line of union of the decidua and muscularis, but penetrate deeply into the latter structure. The decidua attains the highest development of which it is capable in the unimpregnated uterus just before a menstrual flow. At this time its elements, matrix, cells, walls of blood-vessels, etc., undergo fatty degeneration. In consequence of this degeneration, and of the contraction of the uterine wall, the decidua becomes greatly congested, the walls of its blood-vessels yield, and blood becomes effused into its superficial layer. After this has taken place, the whole of the membrane undergoes rapid disintegration and dissolution, and is ultimately carried away as *débris* in the menstrual fluid. By this process all the vessels of the

decidua, which run more or less perpendicularly to the inner surface of the uterus—both arteries and veins—are laid open, and hæmorrhage—the hæmorrhage of menstruation—follows.

Menstruation is not, therefore, a separation of blood, or of blood and mucus simply, from the body by the uterus, but the molecular removal of a tissue which has become useless; and the hæmorrhage is the result of the destructive process by which the useless material is removed from the body. It is the terminal change of a cycle, beginning with the development of a new decidua and ending with its destruction. Aveling describes this as a process of denidation, as it is the carrying away of a nidus prepared for the reception of an impregnated ovum; while the process of growth by which a decidua is formed during every intermenstrual interval is called nidation.

It has generally been believed that menstruation was the result of an ovarian influence, and that this influence emanated from the maturation and rupture of a Graafian follicle; and in accordance with this view it was long maintained that a Graafian vesicle ruptured with every menstrual epoch. It cannot be doubted that an ovum is discharged, in the great majority of cases, in connection with menstruation; at the same time it must be stated that a considerable number of cases have been recorded in which menstruation had taken place unaccompanied by maturation and rupture of an ovarian vesicle, and these cases are sufficient to show that menstruation is independent of the discharge of ova.

It was, and is still, generally maintained that in the absence of the ovaries menstruation is impossible, but since ovariectomy has been so widely practised, several cases have been observed in which both ovaries have been removed, and yet menstruation has continued to recur regularly for years. Still, it may be affirmed as a general law that when the ovaries are extirpated or become atrophied, menstruation does not reappear. In women whose ovaries are not developed, or where they have been removed before puberty, menstruation does not occur. This may be explained by the fact that a stimulus to the nervous system originating in the ovaries is requisite for the establishment of menstruation, and the recurrence of this function after removal of the ovaries is due to the habit of periodicity acquired during the ovarian activity.

Facts have been observed proving that ovulation may occur without menstruation, and equally that menstruation may take place without any evidence of ovulation on the most careful examination *post mortem*. Women who have never menstruated have conceived, and even conception during lactation, whilst menstruation is suspended, is not uncommon.

The association of ovulation with menstruation, although by no means an invariable, is still the general rule. The maturation of ova, and most frequently their dehiscence, although revealed generally by the appearance of the catamenia, may still occur in the intermenstrual intervals, certain conditions accelerating or retarding their development. The influence of the hyperæmia induced

by coitus may hasten the maturation of ova, and especially their escape from the ovary. Conception is possible at any stage of the intermenstrual period, though menstruation being the natural epoch for the escape of ova, conception is most likely to occur about this time.

The first appearance of the catamenia generally takes place between the thirteenth and fifteenth year in temperate climates. It may, however, appear as early as the ninth or tenth year, or be delayed until the twentieth year, or even later. It appears earlier in warm than in cold climates, in the inhabitants of towns than in those of the country, in brunettes than in blondes, and in certain races than others. The exact time of its advent in any given instance depends on the state of the general health, the development of the system generally, and the organs of generation particularly, luxurious living and libidinous excitement tending to forestall the ordinary period, whilst the contrary conditions of hard living and freedom from sexual emotion tend to postpone it.

Coincidentally with the appearance of the catamenia we have other indications of puberty, such as development of the mammæ, hair upon the pubes, and well-marked changes in the mental condition as well as the disposition and bearing of the girl. Precocious menstruation is occasionally witnessed in very young girls and even infants, the pelvis and breasts being unusually developed, and the stature stunted. Premature menstruation is not infrequent, children as young as eight and ten years having before now borne living children at full term. In premature menstruation the growth of the body is not usually interfered with.

The first appearance may vary between the age of thirteen and sixteen and a half years, the extremes being eight to twenty-five.

The cessation of menstruation, which is generally spoken of as the climacteric period, the menopause, or change of life, generally occurs about forty-five, the average of menstrual life being usually thirty years. A healthy woman, living the full span of her life, is so organized that the condition necessary for continuing the race recurs with her nearly four hundred times during the years of her full strength. The menopause not unfrequently occurs in women who present no other signs of ill-health as early as twenty-five or thirty, and instances are recorded where women have been regular up to sixty and even later. The earlier menstruation commences the later is it likely to be prolonged, the ovarian activity in these cases being often well-marked. The converse also holds good. In cases of superinvolution following parturition, the uterus becomes atrophied, and thus induces premature senility. Instances of pregnancy occurring late in life are not uncommon, but "the laws of physiology, the experience of mankind, and the decision of courts of law justify a medical man in declaring that a woman over fifty-five years of age is past the period of childbearing."

The source of the menstrual blood is mainly from the cavity of the body of the uterus, that portion of the internal surface of the womb which is lined with the decidual membrane. Dr. Barnes

states: "This intense vascular engorgement involves the ovaries and Fallopian tubes as well as the uterus; and there is no doubt that blood is effused from the whole tract of the tubo-uterine mucous membrane."

The cervical mucous membrane remains intact during menstruation, and does not normally contribute in any way to the discharge of blood. The average period of flow is from three to five days, but it may be prolonged to seven or eight without being abnormal. It continues longer, as a rule, in women who reside in towns than in those who live in the country; longer in small, delicate, nervous women than in those who are tall, robust, and of a sanguine temperament; longer also in those who lead a sedentary, easy, voluptuous life, than in those who follow active occupations, whose diet is conducive to health, and whose manners are regular.

The typical periodicity is every twenty-eight days, but varies from three to five weeks.

The amount lost varies in different women, and even at different seasons of the year, or under varying conditions of health. It is estimated that the average loss is from three to four ounces, though six to eight ounces is no unusual amount in some women. The influence of exercise, and especially of coitus, in increasing the discharge is often noticed. Englishwomen often suffer from menorrhagia as long as they reside in India, the flow diminishing materially on their return to their native country. Some periods are naturally profuse, others scanty; there is no invariable uniformity.

The menstrual discharge consists of blood, the *débris* of the decidua, mucus, and epithelium from the uterus and vagina. Mixture with the acid vaginal secretion prevents coagulation as a rule, but if the flow be excessive, or retention within the uterus, from stenosis or flexion, occur, clots are found. Normally there should be neither shreds nor clots.

Menstruation being normally a physiological process, little or no discomfort is experienced by women in a state of health; but where the condition of the general health is deteriorated, or the nervous system very impressionable, certain premonitory symptoms are not unusual. These are known as *molimina menstruationis*, and consist of a sensation of weight and fulness in the pelvis, bearing down or dragging, a feeling of weariness or aching in the loins, radiating downwards to the perineum and occasionally extending down the thighs. There is slight tenderness over the hypogastric and inguinal regions, with not infrequently a burning sensation. In some instances there is irritability of the bladder, frequency of micturition, or even retention. The regularity of the bowels is often interfered with, constipation or diarrhœa being not uncommon. The appetite fails, nausea or sickness is occasionally experienced, and the patient complains of feeling "unwell." The breasts become hard and tender, and in some instances severe neuralgic pains are experienced in them. Dr. Barnes has pointed out that menstruation, and probably ovulation also, are, like pregnancy, preceded and accompanied by increased central nerve irritability

and increased vascular tension. Fretfulness, irritability of temper, and increased tendency to attacks of hysteria, migraine, or epilepsy, are often noticed when any predisposition exists.

Vascular Disorders of Uterus.—The uterus is an organ peculiarly liable to alterations in its vascular supply. Its tissue being to a certain extent erectile, and the organ being surrounded by a mass of blood-vessels passing in every direction through the loose connective tissue of the pelvis, it is directly affected by any increase or diminution in the neighboring circulation. Dr. Barnes distinguishes four grades or conditions characterized by excessive blood-supply, viz.: 1. Fluxion, or simple determination of blood. 2. Hyperæmia. 3. Congestion or engorgement. 4. Inflammation, which may be regarded as the climax of the first three conditions. Dr. Barnes, in his clinical history of diseases of women, has discussed these several conditions most fully, and in a way that no other modern author has attempted. The following observations as to the causes and symptoms of hyperæmia are almost entirely condensed from this source.

Fluxion is merely a transient hyperæmia, or flow of blood to the parts, analogous to that witnessed in the rush of blood to the cheeks under the emotions of shame or anger. It is purely a physiological process, and if it occurs in healthy organs entails no ill effects, unless it be artificially and inordinately stimulated. Instances of fluxion are witnessed in the determination of blood to the uterus as a result of ovulation at the menstrual periods, from sexual excitement, from reflex irritation, as when the child is put to the breast, and in the vascular fulness determined by the developmental attraction of pregnancy, the growth of fibroid tumors or polypi, and even of cancer. The tendency to fluxion is increased where the ovaries or uterus are in an abnormal condition, whether from congestion, inflammation, displacement, or from being the seat of new formations.

The symptoms are mostly subjective, the patient experiencing a sensation of local heat and fulness, depending upon the turgidity of the organs affected, and the tension of the plexuses and erectile portions of the vascular system. If varicose veins exist in the legs, thighs, or groins, the effect of fluxion is seen in a marked manner at the menstrual periods. The veins visibly swell, become tumid, deeper-colored; œdema sometimes occurs. When fluxion occurs in morbid structures, the symptoms are commonly more severe. Pain is more marked; the sense of fulness, of weight, is more oppressive; dragging pain is felt in the loins and groins; and often sharp colic spasms in the stomach in the region of the umbilicus. The vascular tension seeks relief in discharges; these present themselves as hæmorrhage, leucorrhœal or mucous discharges, and escape from the mucous membrane of the uterus, vagina, bladder, or rectum.

Certain general symptoms precede and attend the local phenomena. There is a state of tension, marked by a chill or even by a rigor, by spasm, vague nervous phenomena, irritability or depres-

sion of temper, restlessness, perhaps hysteria. The objective signs are: distention of the hypogastrium, increase of heat, and slight development of pain on pressure. The vagina is relaxed, the uterus increased in bulk, lower in the pelvis, and is tender to the touch, the cervix soft and smaller.

Hyperæmia consists in a continuous or chronic fulness of the vessels of a part, which does not necessarily imply morbid action in that part, but which at most leads to languid, passive changes. It occurs especially in connection with excessive menstrual congestion; the uterus is full of blood, dark-red, swollen, softened; the mucous membrane is injected, red, swollen, with a spongy, flocculent aspect, from the development of its uterine tubular glands, softened and bleeding.

Hyperæmia of the uterine mucous membrane occurs in the course of typhus, cholera, typhoid, the exanthemata, and scurvy.

The uterus becomes hyperæmic and swollen when the pelvic system of veins is overloaded, and especially when flexions or displacements of the organ exist.

New formations cause and keep up hyperæmia, sometimes more marked in the uterine substance, sometimes in the mucous membrane. It also occurs in heart disease, from obstruction to the return of blood through the vena cava.

Persisting hyperæmia leads to persistent secretion of mucus, and to hypertrophy of the uterus, commonly of the eccentric form; to hypertrophy of the vaginal portion, with predominance of the connective tissue; and thence to induration, the so-called infarctus. Hyperæmia disposes to œdema of the tissues, and to hæmorrhage mostly due to portal obstruction, and to the general want of vascular tone arising from obesity and want of exercise. There is often a chronic pelvic hyperæmia in aged women, leading to hæmorrhage. There is a sense of weight and heat, often some degree of prolapsus, and also a troublesome form of pruritus.

Dr. Galabin has directed attention to the fact that among the wealthy passive hyperæmia is apt to be promoted by the excessive use of the dorsal reclining position in cushioned chairs or sofas, as opposed to the recumbent posture, and by the use of feather-beds instead of firm mattresses. He observes that in the dorsal reclining position the pelvic brim is rendered nearly horizontal, instead of being inclined about 55° to the horizon, as it should be in the upright position. The pelvis is thus exposed to the full weight of the abdominal viscera, and the return of venous blood from it is at the greatest disadvantage, while any tendency to retroversion or retroflexion is promoted by gravity. At the same time the use of soft cushions obviates the natural tendency which persons resting on a harder seat have to change their position frequently, and to assist, in an important degree, the venous circulation. In lying on a feather-bed, also, the pelvis sinks in and becomes the lowest part of the body, whereas upon a hard couch, in consequence of the greater width of the hips, the pelvis is somewhat higher than the shoulders.

Congestion or Engorgement of the Uterus and Ovaries.—This condition implies, according to Dr. Barnes, a more prolonged fulness of the vessels than mere fluxion; it rarely exists without some amount of retardation of the blood in the vessels, that is, hyperæmia; and this retardation almost certainly entails more or less effusion of the serous or aqueous elements of the blood into the tissues of the organs affected. This implies swelling or tumefaction. Once set up, this condition is extremely liable to persist.

Congestion may arise from many causes. If the organs are caught whilst under the influence of physiological fluxion by constitutional shock, by exposure to cold, or protracted fatigue, fluxion may pass into congestion.

Congestion of the uterus very frequently takes its rise in the state of imperfect contraction and involution following pregnancy and labor. The relaxed tissues and dilated vessels form a ready receptacle for the blood, and the want of tone and contractility obviously favors its retention. Congestion is soon aggravated by displacement of the womb, the organ almost invariably sinking lower in the pelvis, or becoming ante- or retro-verted or flexed. The vessels thus becoming twisted, distorted, or compressed at the point of entry and exit, blood can still enter the uterus by virtue of the propelling *vis à tergo* through the arteries; but the veins, thin-walled, flaccid, and valveless, rendered tortuous and compressed, afford but a difficult return.

Uterine congestion complicates, or plays an important part, in a large proportion of cases of uterine disease. It constitutes one of the most serious obstacles to their cure. It tends by its very conditions to perpetuate itself. It exhibits little or no tendency towards spontaneous recovery. The organ in which it occurs is rendered permanently larger, its tissues are infiltrated with serum or semi-plastic extravasations, its contractile force and the tonicity of its vessels are impaired; the blood brought to the uterus either by the ordinary distribution or by intermittent fluxions is delayed; a kind of hæmostasis is induced; and these conditions are aggravated by time, by the increasing mechanical impediment to the course of the pelvic circulation, which displacement of the uterus in relation to the broad ligament induces.

Uterine congestion may be primary, and for an indefinite time constitute the chief morbid condition. It rarely exists long without inducing displacement or prolapse of the uterus; and sooner or later it is likely to lead to other evils, as hypertrophy and inflammation.

It may be secondary upon other conditions. Fixing of the uterus almost infallibly induces congestion, whether this be from perimetric adhesions, from compression of tumors, from pressure against the symphysis pubis by retro-uterine hæmatocele, or other cause. But the most frequent cause is retroflexion with locking of the fundus beneath the sacral promontory.

The symptoms are essentially the same as those which mark the combination of fluxion and hyperæmia; the diagnostic test being

the persistence of the symptoms, and the accidental intermittent character of the fluxions which may or may not complicate this congestion. There is also more pain than in hyperæmia. The enlarged uterus, by its proximity to the bladder and rectum, irritates these organs, and thus keeps up hyperæmia in the surrounding pelvic tissues. The reflex irritation causes frequent desire to void urine, and dysuria. Dysmenorrhœa is a frequent consequence of congestion, especially if displacement of the uterus be also present. The difficulty which congestion occasions to the uterus in the performance of its functions becomes a source of aggravation of the congestion. Menstruation becomes disordered, occasionally scanty, frequently irregular.

Leucorrhœa is an almost constant effect of congestion: the gorged vessels of the uterus seek relief by secretion of mucus, the glands undergoing enormous development.

The local signs are the increased bulk and weight of the organ, involving diminished mobility and more or less displacement—generally prolapsus or retroversion or flexion. The vaginal portion of the cervix is seen to be swollen and red, and bleeds readily on examination.

Treatment.—For simple fluxion rest is very important. The observance of hygienic precautions calculated to obviate or avert the irregular fluxions provoked by accidental, emotional, and local irritation should be attended to as far as possible. They cannot always be foreseen or guarded against, but familiarity with the idiosyncrasy and surroundings of the patient will often enable us to avert some of these irritations.

There is one very effective agent in turning away the fluxion from the organ predestined to be its seat, which it is almost hopeless to recommend at the present time, and that is venesection. The doctrine of revulsion teaches that we may divert the torrent of the circulation from an organ towards which irritation conducts it, by setting up an artificial fluxion to another part. A small bleeding from the arm, timely practised, may not only save a greater effusion, by turning aside the current from the morbid surface, but by lessening the vascular activity in the diseased organ may check the progress of the disease. This mode of revulsion is especially useful in young plethoric persons, and when the fluxion is recent or only impending.

Another form of revulsive treatment, less powerful, consists in causing derivation to the skin or intestinal canal. By epispastics, by blisters, or fomentations, we can excite some degree of local afflux to a distant part of the body. By purgatives we can cause a derivation to the intestine, and take off some degree of vascular tension by drawing off a portion of the watery element of the blood.

A revulsive recommended by Hippocrates is the application of dry-cupping to the breasts.

Certain medicines possess the valuable property of allaying and regulating vascular excitation. Of these the most useful are the

acetate of ammonia, nitrate of potash, tartarated antimony, aconite, digitalis, veratrum, salicylic acid.

A very useful formula is \mathcal{R} liq. ammon. acet. \mathfrak{z} ij, potass. nitrat. gr. xv, vini antim. \mathfrak{m} xv, infusi digitalis \mathfrak{z} ij, aquæ \mathfrak{z} ij, to be taken every three or four hours. It determines to the skin and intestinal canal; it may possibly provoke nausea or vomiting, but this has a powerful influence in checking hæmorrhage.

Ergot, strychnia, digitalis, bromide of potassium and ammonium, are the drugs most to be relied upon in influencing hyperæmia and congestion. Ergot in the form of ext. ergotæ liq. \mathfrak{z} ss, given with tinct. cinch. co. \mathfrak{m} xx, in the form of a mixture, thrice daily, exerts a very beneficial influence upon the muscular walls of the uterus, as well as in contracting the arteries and so lessening any tendency to hæmorrhage.

Strychnia exercises a similar effect and is a valuable tonic as well. Digitalis in some instances seems to strengthen the heart's action and diminish general venous pressure, and may be given in conjunction with either of the others.

Bromide of potassium is one of our most reliable sedatives for the sexual system, acting at the same time as a general vascular and nervous sedative. Owing to its general depressant effect, it is well to combine it with some tonic. Twenty to thirty grains given with liq. arsenicalis \mathfrak{m} v, thrice daily, produces all the beneficial effects, and is less likely to cause bromic acne in susceptible subjects.

Where the catamenia are suppressed or scanty it may be well to give the syr. ferri bromid. \mathfrak{z} j, in water, thrice daily, as the bromide alone tends to diminish the quantity of the menstrual flow and lengthen the intervals.

Where hyperæmia is dependent upon ovarian irritation, the iodide of potassium is very useful combined with the bromide.

The general health must be considered. The diet should be light and unstimulating, alcohol being avoided or given in very small quantities. The bowels must be carefully regulated, so as to preclude all risk of venous obstruction from fæcal accumulation. The Hunyadi Janos or Püllna water, a wineglassful with the same quantity of hot water, taken in the early morning, acts very well in most cases. Any of the saline aperients, such as the sulphate of soda or magnesia, may be given, alone or combined with tonics, in half to one drachm doses twice or thrice daily. A cold hip-bath of a morning, when the season permits, or a bath at a temperature of 60° F. in winter, will exercise a stimulating influence upon the general circulation and lessen the tendency to hyperæmia.

All prolonged standing, sedentary occupations, and lying constantly on the back should be avoided, the patient being encouraged to assume the lateral or semi-prone position from time to time on a flat couch, and not allowed to sit propped up in easy-chairs.

Any displacement of the uterus must at once be remedied by a suitable form of pessary, more especially any flexion or prolapse. Care must be taken before the advent of the menstrual period to

avoid all risk of cold, prolonged exertion, or other exciting cause of hyperæmia.

Local Depletion.—This will often be requisite where the congestion is accompanied by intense pain and sense of weight, the bulk of the uterus being sensibly increased. If the congestion be liable to periodical aggravation, especially if attended by hæmorrhage, the principle of derivation and revulsion should be invoked.

The methods usually adopted for depleting the uterus are puncturing the cervix, scarification, and leeches.

Puncturing is by far the simplest and most effectual method of relieving congestion, and has the advantage of not encouraging a renewed determination of blood to the uterus, as not infrequently happens from the suction

of leeches. The cleanliest and most convenient mode of depleting by this means is to pass an ordinary cylindrical Ferguson's speculum so as to expose the cervix, the patient lying in the left lateral or semi-prone position. Two or three punctures are then made with a lance-headed scarificator having a long handle (Fig. 93), a spear-headed needle (Fig. 92), a triangular surgical needle held in a pair of torsion-forceps, or a sharp-pointed bistoury. It will depend upon the condition of the cervix, and the amount of blood desired to be withdrawn, how many and how deep the punctures shall be.

It is well at first to puncture the left side of the cervix in two or three places, an eighth to a quarter of an inch in depth, and be guided by the rapidity and the quantity of the flow whether we repeat the punctures on the upper or right side of the cervix. By this plan the surface is not obscured by the blood, as would be the case if we punctured indiscriminately.

A small piece of sponge, held in a mop-holder, soaked in hot water, may be used from time to time to remove the clots from the punctures, and so encourage the bleeding, or if necessary, a stream of hot water may be injected along the speculum with the same object. If sufficient blood be not extracted, fresh punctures may be made until one or two ounces, or as much as deemed requisite, has been obtained. If the lance-shaped scarificator be employed, the punctures should radiate from the centre, the edge of the instrument being directed towards the os uteri. A plug of cotton saturated in glycerin, with a string attached, is then passed up to the cervix and the speculum with-

FIG. 92.



Spear-headed Needle for Puncturing.

FIG. 93.



Lance-headed Scarificator.

drawn, the plug being removed the following morning, when the syringe should be employed.

Should hæmorrhage persist longer than is wished from any one of the punctures, the end of a knitting-needle heated in a flame may be inserted into the orifice, or a saturated solution of alum injected up to the cervix.

Scarification is more useful when marked granular degeneration of the cervical mucous membrane exists. A cylindrical speculum having been passed, as just described in speaking of puncturing, a spatula-shaped knife, or bistoury, or scarificator curved like a Syme's knife, is carried just within the os uteri, and drawn across the face of the cervix several times, thus severing the superficial vessels, and so affording exit to the blood. In some cases where the os is pinhole and tends to keep up the congested condition by preventing free exit of discharges, the curved scarificator is of much service in enlarging the os by a series of incisions radiating from the centre.

In cases where the endometrium of the cervix is specially involved, scarification by means of linear incisions often proves very serviceable.

A glycerin plug should then be inserted and allowed to remain in from twelve to twenty-four hours, so as to assist and prolong the process of depletion.

Leeches, although frequently applied with the object of depleting the uterus, are really of more service in cases of amenorrhœa, as they tend by their suction to encourage a temporary fluxion, and so attract blood to the pelvic organs. The vascular system of the pelvis has been likened, not inaptly, to a sponge. The free anastomoses between the branches of the internal iliac and the valveless veins, with the numerous plexiform structures, constitute a peculiar formation unfavorable to local bleeding by exhaustion. If we draw blood from any one part it is immediately replaced by a new supply, the vessels can hardly be emptied, so that any local engorgement is but little diminished. Dr. Barnes remarks, "I now resort to this practice with very great circumspection." Regarded from a practical point of view, the application of leeches to the cervix uteri is not only unsatisfactory, tedious, and troublesome, but also very uncertain in its results. Occasionally they cause severe pain, amounting to agony, especially if one crawls into the uterine cavity and attaches itself there. Urticaria not unfrequently results. Sometimes it is difficult to get them to bite, at others to arrest the bleeding, and the quantity abstracted is always uncertain. If their application be entrusted to a nurse, considerable inconvenience may be caused by the prolonged unscientific attempts to get the cervix into the field of the speculum, and more harm done to a tender, inflamed uterus than any good likely to be derived from the depletion. For these reasons I very rarely employ them now, but resort to puncture in preference, as being more certain, less troublesome, and much safer.

However, if it be decided to apply leeches to the cervix, the best

way of doing so is to pass as large a Fergusson's speculum as the vagina will accommodate, and get the cervix well in view. With a mop of cotton wipe the cervix perfectly clean, plug the os with a small piece of cotton to which a thread is attached for its removal and then puncture or scarify the cervix lightly so as to draw a few drops of blood. Four to six leeches will generally be sufficient. Having dried them, place them in the speculum and press them up towards the cervix by a plug of cotton-wool, or apply each one separately by means of leeching-forceps, keeping the speculum pressed firmly against the roof of the vagina, so that the leeches cannot insinuate themselves between the speculum and the vaginal walls. The lower end of the speculum will need to be carefully watched for a quarter of an hour or so, until the leeches have taken and fallen off, as otherwise they may refuse to bite and attempt to worn their way out most insidiously between the wool-plug and the speculum, and to escape without being noticed. At the end of twenty minutes the cotton-plug may be removed, and any leeches that have filled and fallen off removed, any still remaining being removed by a pair of forceps. The usual plan is to place the leeches in a plate or saucer, and sprinkle salt over them to make them disgorge their contents. They should never be used a second time.

Should by any possibility a leech enter the cavity of the uterus through a patulous os, and attach itself there, becoming so distended with blood as to preclude its return, severe uterine colic may be produced, hæmorrhage may persist, or metritis even be set up. As a rule, the leech is soon expelled by uterine contractions. Should the hæmorrhage prove excessive or prolonged, the cervix may be plugged. If the pain be severe, opium should be administered.

When the leeches have been removed, a stream of hot water should be injected into the speculum to wash away all clots, a plug soaked in glycerin passed up to the cervix, and the patient kept lying down for the remainder of the day. Should hæmorrhage persist, and the injection of cold water fail to arrest it, the better plan will be at once to pass the speculum again, cleanse the vagina and apply a dossil of cotton-wool soaked in alum or the perchloride of iron to the bite, or a plug soaked in a strong solution of alum may be pressed up against the cervix, other plugs being packed behind it so as to ensure pressure as well.

If these means fail, the point of a knitting-needle heated in a flame may be passed into the leech-bite, when the bleeding will at once be arrested.

As a general rule, leeches should not be applied in the consulting-room, but only when the patient is in bed, where she can remain as long as necessary. Apart from their application often proving very tedious, if the patient be allowed to walk or drive home shortly afterwards, the risk of prolonged hæmorrhage is thereby increased and there is also danger of the patient catching cold.

The proper time to apply leeches, as regards the menstrual period will vary, depending upon the nature of the case. It is, however

seldom prudent to apply them within a week of the expected catamenia, unless the pain and discomfort attending the flow are marked. Where the catamenia are scanty and there is much discomfort following the cessation, depletion immediately following the flow is frequently indicated.

The process of depletion will generally need to be repeated at intervals of a fortnight or so until the condition necessitating such treatment has disappeared.

The employment of the hot-water vaginal douche, as elsewhere indicated, will often obviate the necessity of resorting to any local depletion, or may prove a useful adjunct. Another extremely useful and convenient method of depleting the uterine vessels is by means of the glycerin plug. A tampon of cotton-wool, with a string attached, sufficiently large to soak up at least half an ounce of glycerin, is passed up to the cervix and allowed to remain there from twelve to twenty-four hours. A copious watery discharge from the cervix and vagina is thus produced, thereby relieving the congestion and preventing our having to resort to more direct depletion.

CHAPTER IX.

INFLAMMATION OF THE UTERUS.

Inflammation of the Uterus.—This may be acute or chronic, limited to the cervix or to the body, or affecting both conjointly. The parenchyma of the uterus may be chiefly involved, or the lining membrane mainly affected.

The term *metritis* is applied to inflammation of the substance or parenchyma of the uterus; *endometritis* to inflammation of the lining mucous membrane. This is a somewhat arbitrary distinction, for the inflammatory process is never entirely confined to one or other structure, but involves both to a greater or less extent. In the very acute form of inflammation the whole of the tissues, both of the body and cervix, are involved. It will be convenient, therefore, to consider acute metritis and acute endometritis conjointly.

When the inflammation is of a less acute character and chronic in its duration, it may be limited more to one or other portion of the uterus, the body or cervix, or to the parenchyma or lining mucous membrane, though, as before observed, both structures are generally implicated. Most mucous membranes are separated from the structures lying beneath them by a layer of loose areolar tissue; the mucous membrane of the uterus, however, is itself of a dense character, consisting mainly of closely-packed round or slightly elongated cells, and is intimately connected with the muscular wall, without any intervening areolar tissue. The extremities of the glands even dip more or less into the muscular layer, and it is probable that a considerable proportion of the thickness of the uterine wall really corresponds in development to the muscularis mucosæ, so that if endometritis exist it is not likely to be strictly limited to the mucous membrane, but will affect the uterine walls to some depth.

Acute Metritis and Acute Endometritis.—This latter condition is sometimes spoken of as uterine leucorrhœa or catarrh. It often runs a rapid course, and is overlooked until it has subsided into the more chronic form.

Causation.—There are practically three grades of acute inflammation affecting the entire uterus. The first, most intense, and rarest form, is that due to septic absorption as witnessed in cases of abortion and parturition, operations upon the uterus, such as enucleation of fibroid tumors or evacuation of retained menstrual fluid, or even from the use of sponge-tents, or mere division of the cervix.

The inflammatory process generally extends to the peritoneum and surrounding cellular tissue, involving the broad ligaments.

The next occurs for the most part independently of the puerperal state, and seldom runs so severe a course as the former. It is generally dependent upon some traumatic injury, such as the application of powerful styptics or caustics to the interior of the uterus, whether by swabbing or as intra-uterine injections, the wearing of intra-uterine stem pessaries, etc., the absorption of septic material in some cases being more than probably a complicating condition.

The third variety, where though the majority of the tissues are implicated, the inflammatory process is rarely so intense as in the two former, occurs mostly from exposure to cold during menstruation, the extension of gonorrhœal or other acute inflammation from the vagina, injury from intemperate or immoderate coitus, and decomposition of retained menstrual fluid in consequence of flexion or stenosis. As a sequela of the exanthemata, endometritis is not at all infrequent.

The mere passage of the uterine sound in some cases may prove sufficient to set up acute metritis.

Pathology.—In the severe acute stage we have infiltration and softening of the uterine tissue, especially in the layers subjacent to the mucous membrane, with intense and acute hyperæmia of the mucous lining itself, which is red, swollen, œdematous, and softened. Ecchymoses are not infrequent, and even small collections of pus may be noticed between the muscular fibres, in the uterine veins, or in those of the broad ligaments, but abscesses of any size are exceedingly rare in the wall of the uterus. The inflammation not infrequently extends from the uterine mucous membrane along the Fallopian tubes to the peritoneum, causing salpingitis and purulent peritonitis, with pelvic cellulitis and even abscess of the ovary, the intensity of these latter symptoms often preponderating over those of the primary disease.

Symptoms.—In the septic and traumatic varieties of metritis the onset of the attack is usually evidenced by a rigor, acceleration of pulse, elevation of temperature, and other well-marked febrile symptoms. The patient complains of a feeling of heat and fulness; bearing down or dragging in the pelvis; pains in the back radiating to the groins and thighs; tenderness over the lower abdomen, which is more or less tympanitic; tenesmus of the bladder and rectum, and not infrequently of the uterus as well. The pulse soon becomes very rapid, small, and compressible. Where peritonitis is marked, the abdomen becomes very tympanitic, the breathing often hurried, the breath having the peculiar sweetish odor so characteristic of septicæmia.

Where septic metritis ensues as a consequence of abortion or parturition, the discharge or lochia becomes arrested. In some cases of traumatic injury, such as occurs when a piece of solid nitrate of silver is inserted or falls into the uterine cavity, a profuse hæmorrhagic discharge arises, constituting the "metritis hæmorrhagica" of West.

Where the inflammation is chiefly confined to the lining membrane of the uterus and to the subjacent muscular tissue, the peri-

toneum and surrounding cellular tissue not being involved—acute endometritis proper—the symptoms are not so urgent. The patient experiences throbbing, with a sense of weight or bearing down; irritation of the bladder, pain and tenderness on movement or pressure. The pain in some instances is paroxysmal from uterine tenesmus, and may last for an hour or two at a time, exhausting the patient to an extreme degree. The bowels are usually constipated, but occasional attacks of diarrhœa from reflex irritation of the rectal nerves at times occur.

The discharge in the first instance is generally very slight and of a serous nature; after a few days it becomes more profuse and muco-purulent, often tinged with blood. It is more or less acrid and of an offensive odor, setting up intense irritation if allowed to come in contact with the surrounding parts, and may produce excoriation with pruritus of a most troublesome character.

Physical Signs.—On examination the vagina is found to the touch to be hot and dry, the uterus bulky, tender, and softened; the os uteri gaping, the cervix swollen, very sensitive to pressure, and lower than normal in the pelvis.

By the aid of the speculum the cervix may be seen to be œdematous, enlarged, and of a livid hue.

The discharge exuding from the os may be either clear and albuminous, muco-purulent, or viscid, hanging out in a long string.

No attempt should be made to pass the uterine sound for fear of aggravating the already existing mischief, and even the speculum must be passed with the greatest care, as considerable pain is produced by pressing on the uterus.

Differentiation.—The slighter degrees of acute metritis and endometritis, uncomplicated by peritonitis or pelvic cellulitis, may be recognized by the increased bulk and tenderness of the uterus or conjoined manipulation, and its mobility. The conditions most liable to be confounded with acute metritis or endometritis, are pelvic peritonitis and cellulitis, and possibly acute vaginitis.

The constitutional symptoms of the two former are generally more marked than in the disease we are now considering. The initiatory rigor, rapidity of pulse, and elevation of temperature will often point to the nature of the inflammation. The immobility of the uterus from surrounding deposit, without any unusual increase of uterine discharge, will also assist us in forming an opinion. In vaginitis the constitutional disturbance is often less marked, the situation of the pain somewhat different, and the discharge from the vagina characteristic.

Prognosis.—The simpler forms may end in recovery within five or six weeks without having attracted much attention, or may merge into the chronic form, relapses not infrequently taking place at successive menstrual periods.

In the septic form, whether puerperal or traumatic, the prognosis is always grave, the inflammation extending to the peritoneum, and setting up purulent peritonitis, which proves rapidly fatal.

Treatment.—It is important to distinguish the different varieties, as the management of the case will vary, depending upon the severity of the attack.

In septic metritis, the symptoms from the first are often of an adynamic type. Any portion of retained placenta or ovum, clot, decomposing tumor, or *débris*, should at once be removed if possible. A stream of carbolized or iodized water should first be injected, or allowed to gravitate into the uterus, so as to wash away any *débris* or decomposing matter. If the cervix be sufficiently dilated the finger may then be introduced, and the cavity of the uterus carefully explored. Should this be found impracticable, anæsthesia may be induced, and then the finger pushed carefully in, or we may dilate the cervix by means of a sponge-tent, and then explore the interior. If no *débris* be detected, it may still be advisable to wash out the cavity of the uterus at least twice a day, oftener if the discharge be very offensive, as the system may be enabled to withstand a moderate dose of the poisonous material, but prove quite unable to tolerate the continuous or intermittent administration of fresh doses of septic matter.

Internally quinine proves most valuable, given in 10, 15, or 20 grain doses every four hours, until the temperature comes down or intolerance of the drug is established. If the patient's stomach is irritable and such doses cannot be retained, the kinato of quinine in less quantity may be injected subcutaneously. A solution of fifteen grains to the drachm of water is made, and the injection repeated at short intervals. Warburg's tincture in half-ounce doses every three or four hours for two or three doses will sometimes be retained by the stomach when quinine itself fails to be so. Turpentine in $\mathfrak{m}\text{xv}$ – xx doses, given in mucilage, occasionally acts as a useful stimulant, where much tympanitis is present.

Opium in some form will generally be requisite to allay pain and quiet nervous disturbance. A pill of quinine gr. ij, with extract. opii gr. ss–j, answers well, given every three or four hours if necessary. Morphia, as suppository or hypodermically, may be tried. The liquor opii sed. in $\mathfrak{m}\text{xv}$ – xxx doses proves very useful in some cases.

An enema of starch and laudanum ($\mathfrak{m}\text{xx}$ – xxx) frequently repeated, or a suppository of morphia (gr. $\frac{1}{3}$ – $\frac{1}{2}$), may be given with good effect.

Where the temperature runs high and threatens life by its persistent elevation, efforts should be made to reduce this by the application of cold. This may be effected by means of Thornton's ice-water cap, which consists of coils of india-rubber tubing, through which a continuous stream of ice-cold water can be made to circulate round the head. Another method is to employ a water-bed, and change the water repeatedly, or continuously by an improved method whereby cold water runs in at one extremity and passes out by another tube at the other extremity of the bed. Small water-cushions, filled with ice-cold water, may be packed around the patient, and thus serve to diminish the temperature. In some

cases small doses of tincture of aconite or of tincture of veratrum viride frequently repeated may prove of service.

No aperient medicine should be prescribed; if any accumulation be present, an enema of olive oil will accomplish all that is requisite.

Some authors still recommend calomel and opium in the early stage; 1 gr. of the former with $\frac{1}{2}$ gr. of the latter, given in form of pill every four, six, or eight hours for the first forty-eight hours, being careful to stop short of salivation; but in cases of severe septic metritis it is of the first importance not to lower still further the vital powers. Opium alone should be regarded as our sheet-anchor, and given sufficiently often to keep the patient free from pain.

Leeches are seldom indicated, and only annoy the patient.

Locally, a poultice of crushed linseed covered by oil-silk should be placed over the hypogastrium, and changed only morning and evening. Where even the weight of this proves too much for the patient, the surface of the abdomen may be smeared over with a mixture of the extract of belladonna (3ss) and glycerin (3iijss), and then covered over with a thick layer of cotton-wool and oil-silk externally. This often affords considerable relief.

Hot fomentations with laudanum or turpentine may be employed where the pain is very severe, or the inflammation has spread to the surrounding structures.

The patient's strength in the meantime must be supported by means of milk, beef-tea, jellies, eggs, and other similar forms of nourishment, administered at short intervals.

Alcohol in some form will generally be found requisite, brandy or whiskey being the best forms. If the patient is unable to retain nourishment on her stomach, nutrient enemata must be given. Two ounces of good beef-tea with a like quantity of warm milk, one tablespoonful of brandy, and ℥xx of liq. opii sed., injected every eight hours, will be sufficiently often.

In the simple form of acute metritis and endometritis, uncomplicated by peri-uterine inflammation, the patient must be kept perfectly at rest in bed. After the diagnosis has once been made, all further examinations, employment of speculum or internal applications of any kind, should be avoided. If the case be very severe and it be deemed prudent to apply leeches, they will prove equally serviceable if applied round the anus or over the pubes. From six to ten will generally be sufficient. Hot fomentations, with or without laudanum or turpentine, should be regularly applied to the lower abdomen, or glycerin and belladonna, as before indicated, covered by cotton-wool and oil-silk. Dr. Barnes recommends a plasma consisting of one drachm of extract of belladonna mixed with half an ounce of mild blue ointment and two ounces of simple cerate, spread in a thin layer upon a piece of lint and covered with cotton-wool.

Pain must be alleviated by means of opium or morphia given as suppository, subcutaneously, or in form of pill, or in combination with salines. The only injections likely to prove serviceable

are copious streams of warm water into the vagina as soon as there is any muco-purulent discharge, medicated with a little carbolic acid, 1 in 40, or made soothing with laudanum, $\mathfrak{z}\text{j}$ ad Oj aquam, infusion of bran, linseed, or starch. Warm hip-baths may also be employed, care being taken to allow the water to gain access to the vagina either by means of the bath-speculum or by employing the syringe.

Later on, saline aperients prove of service. The Hunyadi Janos, Püllna, or other natural waters answer well.

Hot-water vaginal injections have lately been strongly advocated by Emmet and others as proving an invaluable aid in the treatment of all conditions of uterine disease. To be effectual the patient should recline in the dorsal position, with the hips elevated, and at least half a gallon or more of water at a temperature of 100° to 110° F. be allowed to flow into the vagina in a continuous stream. This may at first sight seem difficult to accomplish in private practice, but is really very simple, and only needs a little practice and perseverance on the part of the patient to accomplish the object satisfactorily.

An ordinary can, such as is used for holding bath-water, capable of holding one or two gallons of hot water, is placed upon a table or chest of drawers near the bed or couch upon which the patient lies. Three to six feet of india-rubber tubing of about half to three-quarters of an inch bore, having a leaden weight, perforated in the centre, at one end, so as to prevent the tube falling out of the can, and a vaginal tube with stopcock or tap at the other end, is then inserted through the spout of the can. The stopcock being opened the tube is immersed, all but about six or eight inches, in the water so as to fill it; the tap being now turned, the tube is drawn out all but the lower twelve or eighteen inches. When the vaginal end is held at a lower level than that of the water and the tap turned, the natural law of gravitation comes into play, and we have the syphon action produced, whereby a continuous steady stream of water can be made to flow into the vagina without any effort on the part of the patient, and without the intervention of any skilled nurse, servant, or other assistant. By regulating the height at which the can is placed and the calibre of the tube, we can modify the force and size of the jet at pleasure. To prevent the tube collapsing as it hangs out of the spout of the can, it is necessary to have a coil of wire inserted in the final two feet of the tubing.

Another method is to provide a bath-can, a small tub, or other vessel capable of holding about two gallons of hot water. Near the bottom of this is inserted a tap or spigot, to which five or six feet of india-rubber tubing is attached, a tap and vaginal nozzle being added so as to enable the patient to use it herself. Dr. Percival has also invented a syphon uterine douche.

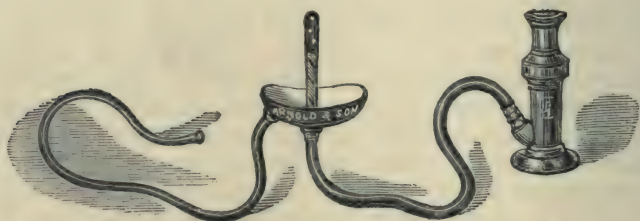
It is impracticable for a patient to use a syringe herself whilst reclining on the back; but this, if necessary, can be entrusted to a nurse.

A certain amount of benefit may doubtless be derived by the patient employing a syringe with hot water whilst sitting over a bidet or other arrangement, but we do not secure the advantages, claimed by Dr. Emmet, gained by his method of injection.

Having overcome this difficulty, our next will be in carrying off the water as it flows from the patient without wetting the bed or soiling the patient's linen. To accomplish this the simplest method to adopt is for the patient to lie crosswise upon the bed, or at the end of a couch, with the hips at the edge, a pillow under the back so as to elevate the hips somewhat, and her feet resting upon chairs. A piece of mackintosh about one yard square is placed over the pillow so as to protect this from getting wet, and the other end is draped into a tub or foot-pan below, so that the water falls into this. It is well for the patient to be undressed ready for bed, but care must be taken that the body is properly covered to protect her from cold, the legs also being covered by a couple of shawls or small blankets.

Another plan is to place a properly constructed bed-pan under the hips, and to employ the douche whilst lying in bed. This is especially useful in cases of serous inflammation, where it is desir-

FIG. 94.



Improved Uterine Douche.

able to avoid lifting or moving the patient more than is absolutely necessary.

An ordinary slipper bed-pan is of no use, as it holds so little that it would necessitate constant emptying; but if a tube be attached to the large end so that the water can flow freely away into a tub or foot-pan below, the difficulty is overcome.

Various devices have been resorted to to obviate the necessity of employing a bed-pan or other similar arrangement. They, however, necessitate the assistance of a second person, and this is in many cases objectionable, for the mere fact of having some one at hand who will save the patient all personal trouble, seems in some cases to remove that healthy stimulus to self-exertion which is at times such an important adjuvant in the case of uterine disorders. Still, there are other cases where it would be out of the question for the patient herself to administer a continuous injection of hot water, and for such the cup or shield apparatus as indicated above may prove of service.

To obviate the risk of the water being injected directly into the uterine cavity, the nozzle must be directed along the recto-vaginal wall until it has reached the posterior vaginal cul-de-sac and the stream allowed to flow gently at first until the vagina has become distended. Still, in some cases where the cervix is lacerated or the cervical canal dilated, there is great risk of the nozzle being passed directly into the cervix and the water forcibly injected into the uterus. Such an accident would set up violent uterine contraction, severe pain, and even collapse. Should the fluid be forced up through the Fallopian tubes, acute pelvic peritonitis, with death as a consequence, might ensue. To prevent this, Thomas suggests the employment of a nozzle with a reverse current, the water flowing back towards the outlet of the vagina, and not directly forwards, as occurs with an ordinary nozzle.

The immediate effect of the hot water is to cause relaxation, and to increase the congestion of the parts; but if its application be prolonged, reaction ensues and contraction takes place. The capillaries are excited to increased action, the tonic effect extends to the coats of the larger vessels, their calibre in turn becomes lessened, and with this approach to healthy action the congestion is diminished. The blood being thus driven from the local parts, the weight of the uterus and its appendages is reduced, the tenderness due to congestion is removed, and when inflammation is present it is relieved. The absorption of products of inflammation is assisted, and the normal mobility and elasticity of the tissues is restored.

Emmet thus describes the effect of hot-water injections. The mucous membrane is found blanched in appearance, and the usual size of the canal lessened in calibre, as after the use of a strong astringent injection. As the patient lies on her back, with her hips elevated, the action of gravity will be brought into play, by which the veins will be rapidly emptied, sufficiently to relieve the over-distention.

Then, in this position also, the vagina will become fully distended by the weight of water, and kept so, since only the surplus amount can run off into the bed-pan beneath. The hot water will then be in contact with every portion of the mucous membrane, under which the capillaries lie. The vessels going to and from the cervix and body of the uterus pass along the pelvis on each side of the vagina, and their branches inclose the vagina in a complete network. The vessels of the fundus, through the veins of which the blood flows to the liver and back into the general circulation, communicate freely by anastomosis with the vessels distributed to the body and cervix below. If, then, we are able to cause the vessels of the vagina to contract, through the stimulus of the hot water, we can, directly or indirectly, influence the whole pelvic circulation, and thus reduce it almost to a natural condition. He finds the best mode of all is to have the injections given while the patient is placed on her knees and elbows or chest. But this position is a difficult one to assume, since those who are in the greatest need of hot water have not the strength to remain in this posture long

enough to accomplish the purpose; and considerable difficulty is also experienced in keeping the patient dry. The hour of bedtime is generally the best in which to seek for the beneficial effects of hot water on the reflex system in allaying the local irritation; for prolonged vaginal injection at a high temperature will often act with more promptness than an anodyne in allaying the nervousness and sleeplessness of an hysterical woman.

In rare instances cases are met with where a sense of weight and an uncomfortable feeling are experienced about the pelvis after an injection of water at the usual temperature.

CHAPTER X.

CHRONIC CERVICAL ENDOMETRITIS.

Chronic Cervical Endometritis.—This term has been applied to chronic inflammation of the mucous membrane of the cervix, or that portion extending between the os internum and the os externum. Other names—such as endo-cervicitis, cervical catarrh, or leucorrhœa—have been employed to designate this condition.

It is probably the most frequent of all diseases of the uterus, judging from the fact that it is almost universally present in the majority of patients seeking advice for uterine disorders.

Pathology.—To understand properly the pathology of this affection, we must call to mind the minute anatomy of the mucous membrane lining the cervix. This is disposed in folds and ridges, constituting the arbor vitæ, is covered over by cylindrical and ciliated epithelium, and studded with numerous villi. Between the folds are countless mucous glands, the so-called glands or follicles of Naboth, the number of which has been estimated as being at least 10,000. When this membrane becomes inflamed it is found to be swollen and hyperæmic, the mucous glands being especially involved, pouring out a glairy, viscid mucus, which fills up the cervical canal in the form of a tenacious plug.

The cervix itself is more or less swollen and softened. The villi or papillæ on the vaginal face of the cervix become hypertrophied, giving rise to an appearance termed granular degeneration.

Later on the mucous membrane itself becomes hypertrophied, and we get eversion of the os and lower portion of the canal.

In those cases following on parturition, where the whole thickness of the cervix becomes inflamed, especially if laceration has taken place, areolar hyperplasia with induration generally occurs.

Causation.—In virgins and nulliparæ we meet with a form of chronic cervical endometritis, due chiefly to catarrhal inflammation of the lining mucous membrane, where the tissue of the cervix is only moderately involved. The causes predisposing to this condition are natural feebleness of constitution, especially if there be any scrofulous or tuberculous tendency, want of fresh air and exercise, insufficient nourishment, and other similar influences. The chief exciting causes will generally be found to be the effect of cold, extension of vaginitis, whether simple or specific, uterine displacements, excessive or intemperate intercourse, and the employment of intra-uterine stems.

In married women who have had one or more children, the whole thickness of the cervix is apt to become inflamed, as a result of the bruising or laceration during parturition. Here the lining

membrane of the cervix not only becomes inflamed, but hyperplasia and induration of the tissue of the cervix ensues. In addition to the causes already mentioned as predisposing to endometritis, frequent parturition, subinvolution, and excessive lactation may also be mentioned. The exciting cause in the majority of cases will be the bruising of the cervix during parturition, more especially where laceration also occurs. Acute puerperal endometritis may terminate in this way.

Symptoms.—Owing to the slight amount of sensibility possessed by the cervix, inflammation may be present without attracting the patient's attention; even the presence of abundant leucorrhœal discharge may pass unnoticed, although on examination with the speculum the canal of the cervix is found to be filled with a glairy, viscid, mucous secretion.

This leucorrhœa is often the first symptom leading the patient to believe anything is amiss. She then begins to experience dragging sensations about the pelvis, bearing down and pain in the back, aggravated on standing or walking, and generally worse towards the menstrual periods, which latter become altered in character, often painful, and irregular as to frequency and quantity.

The discharge is at first of the nature of boiled starch, thick, viscid, albuminous. If villous erosion complicates the cervical endometritis, the discharge is more muco-purulent, tinged with blood, acrid in character, producing considerable irritation in the vagina and vulva, and even setting up inflammation.

As the disease becomes established, constitutional symptoms become more marked. The nutrition becomes impaired, owing to diminished appetite and enfeebled digestion; nausea and vomiting are not infrequent. The patient becomes nervous and hysterical, despondent and fretful; complains of vertical headache, intercostal neuralgia, and other anomalous aches and pains. The abdomen is often distended, the bowels confined, the urine turbid, micturition painful or difficult, the bladder irritable from pressure where hyperplasia with ante- or retro-version exists, cystitis itself being not infrequent.

Where hyperplasia of the cervix complicates endometritis, there is often dull aching pain complained of on sexual intercourse, and hæmorrhage as well if any villous erosion be present.

Physical Signs.—On digital examination we may fail to detect any well-marked evidence of any existing disease; the uterus may not be increased in bulk, nor tender to the touch, unless pressure be applied so as to push up the uterus somewhat. The os uteri may be enlarged, the lips swollen or roughened if any granular degeneration exists, or we may find a perfectly normal os. If now the speculum be passed and the cervix exposed, we shall generally find the canal filled with a tough, tenacious, mucous plug, resembling unboiled white of egg, which resists all ordinary attempts at removal. On extracting this by twisting it round a Playfair's probe coated with cotton-wool, there may be no marked evidence of disease, the glands alone being affected, and no granular degeneration

present; or there may be found an intensely red and inflamed condition of the canal, due to removal of the epithelium and excessive hypertrophy of the villi. If the bivalve, or Sims's, speculum be employed, this condition is more readily observed. Where cervical endometritis occurs as a result of injury during abortion or parturition, there is usually marked hyperplasia of the cervix, with irregularity of the surface from lacerations of the tissue.

Prognosis.—Cervical endometritis as a rule shows little tendency to spontaneous cure; it is a most obstinate disorder, and if unchecked often induces hyperplasia, with consequent displacement and other troubles. The less viscid and the less in quantity the mucous discharge is, the more favorable is the prognosis. Where, however, the granular disease is slight, and the amount of thick, tenacious mucus blocking up the cervical canal considerable, the prognosis is much less hopeful. Destruction of the diseased glands by some radical method here offers the only hope of relief. Treatment is at all times very tedious, and relapses are very liable to occur.

Treatment.—Although chronic cervical endometritis may be regarded as a local disorder, the judicious combination of constitutional remedies with local treatment will be indispensable to secure relief from such an intractable disorder. The general health must be carefully looked to, the bowels regulated by some simple saline or chalybeate aperient, of which the sulphate of magnesia, the double tartrate of soda and potash, Carlsbad salts, and other similar preparations in combination with some form of iron prove most serviceable.

For this purpose a mixture as follows may be prescribed:

R_x. Ferri tartratæ ʒss, sodæ tartratæ ʒj-iss, acid tartarici ʒj-iss, syr. zingib. ʒj, aquæ ad ʒvj.—M. Two tablespoonfuls added to half a tumblerful of warm water, to be taken every morning the first thing, and repeated during the day if necessary.

A less palatable but still useful mixture is: R_x. Magn. sulph. ʒj-iss, ferri sulph. gr. xii, acid. sulph. dil. ʒss-j, syr. zingib. ʒj, aquæ ad ʒvj. Dose as above.

If pills be preferred, a useful combination consists of ext. aloes aquosæ gr. xij, ext. nucis vom. gr. iij (vel extract. belladon. gr. iij); pil. rhei co. gr. xxiv.—M., et. div. in pil. xij. One to be taken every night at bedtime.

A mild, unstimulating, nutritious diet, regular daily exercise, short of fatigue, plenty of fresh air, massage, and everything conducive to health should be enjoined. Occasional warm baths, friction, and wearing of flannel should be resorted to, in order to keep the skin in a healthy condition. To improve the appetite and promote digestion a mixture as follows may be prescribed:

R_x. Acid. nitr. hydrochl. dil. ʒiij, liq. strychniæ ʒj (vel tinct. nucis vom. ʒij-iij) tinct. cinch. co. ʒss, tinct. chlorof. co. ʒiij, syr. aurantii ʒiss, aquæ ad ʒvj. One tablespoonful in a wineglassful of water twice or thrice daily, after meals.

In some cases preparations of bismuth, pepsine, etc., are indicated, and should be prescribed.

Bromide of potassium proves very useful where much nervous disturbance co-exists, but should not be given for too long a time continuously.

Where any doubt of syphilitic infection being present exists, a combination of the hydr. perchl. with pot. iod. often proves eminently serviceable.

Local Treatment.—Where the external os is contracted, it will be better at once to obviate this by making a crucial incision, either with the scissors or scarifier, so as to divide freely the external fibres of the os, touching the raw edges with the liq. ferri perchl., so as to prevent union again taking place. This will enable us to command more thoroughly the cervical canal for the application of remedies, and will also permit the ready exit of discharges. In cases where the cervix is acutely painful or tender, this crucial incision allows a certain amount of blood to flow, and so lessens the engorgement of the cervix, or this may be still further encouraged by stabbing or scarifying the cervix as elsewhere indicated. Where the cervical glands are much enlarged, we may accomplish a certain amount of local depletion as well as obliteration of the diseased glands by scarifying freely the lining membrane of the cervical canal by means of a narrow-bladed knife drawn in parallel lines along the inner surface of the canal.

If the external os be already sufficiently dilated, and local depletion be not deemed necessary, we may proceed at once to the application of remedies.

Treatment should always be commenced shortly after a menstrual period if possible, as there is then less risk of setting up mischief by interference.

It will be prudent to limit our applications at first to the canal of the cervix alone, not carrying them up beyond the internal os, as even when the body of the uterus is implicated, if the inflammation of the cervix be cured, that of the body often disappears in consequence; but should this not happen, treatment can subsequently be directed to this. Before applying any of our remedies, the cervical canal must be thoroughly cleansed of all inspissated mucus. This may readily be effected by passing a Playfair's probe coated with cotton-wool, slightly curved, up the canal, and then twisting the probe round so as to entangle the viscid mucus and then withdraw it. If this fail, a small piece of sponge, the size of a raspberry, fixed in a holder, or held in long dressing-forceps, may be passed up and twisted round, the sponge being then thrown away. A long-nozzled syringe has been invented for this special object, but either of the methods just mentioned will generally prove sufficient.

Should the method indicated still fail in removing the tenacious plug of mucus, it will be well to pass the probe saturated with carbolic acid, or whichever remedy we intend applying, and twist this round several times; this will effectually overcome the diffi-

culty. A second application should then be made so as to ensure thorough cauterization of the diseased surface, the probe being left in sufficiently long so as to irritate the uterus into contracting upon the probe and squeezing out the fluid.

In some cases it is a prudent plan to pass a sponge-tent up as far as the internal os uteri, and allow it to remain in for a few hours, and then make the application on its removal. By this means we unfold the countless convolutions and rugæ of the arbor vitæ, and allow the caustic to come into direct contact with the entire surface.

Vaginal injections of warm water, borax, etc., night and morning, should always be resorted to, if for no other purpose than to cleanse the passage from all secretions, which otherwise keep up irritation.

Mode of applying Caustics to the Cervical Canal.—Having enlarged the external os if necessary, punctured the cervix, or scarified it, to produce local depletion, if requisite, and removed the plug of inspissated mucus generally found blocking up the cervical canal, we have now to consider how best to apply our remedies.

These may be employed either in a liquid form or in form of crayons or pencils. The more usual and probably the most efficacious method is in the form of strong solutions.

A *Playfair's Probe* (Fig. 95), the terminal three inches of which is made of aluminium, so as to resist the effect of acids, is first coated with a thin layer of cotton-wool, the probe being roughened, and having a slight bulb at the terminal extremity so as to prevent the cotton slipping off. Absorbent cotton or jeweller's cotton should be employed, as, being chemically cleaned, it takes up fluid more readily, and the fibre being long and fine the cotton is less likely to become detached.

A thin layer, triangular in shape, about three inches long, is held lightly between the finger and thumb of the left hand, the point of the probe is placed at one angle of this, and then twisted round and round so as to dispose the cotton firmly and evenly over the probe. This requires some little practice to accomplish. Having placed the patient in the left lateral position, ascertained the direction of the canal by means of the uterine sound, and passed a Fergusson's speculum, the probe is then dipped for about two inches in the solution we intend to employ, any superfluity being carefully squeezed out against the neck of the bottle.

The os being well in view, the probe is then passed within as far as the internal os, and allowed to remain for a few seconds, or even for a minute, until the cervix contracts upon the probe and thus secures the complete action of the remedy. The probe is then gently rotated and gradually withdrawn, any excess that may

FIG. 95.

Playfair's
Probe.

have run down into the vaginal cul-de-sac is carefully mopped up, a plug of cotton-wool, with string attached, saturated in glycerin, is then passed up to the cervix, held there by a sound or other instrument until the speculum is withdrawn, when the operation is completed. If this treatment be resorted to in the consulting-room, the patient should as a rule drive home and remain quiet for the rest of the day. The plug may be removed at bedtime, when the syringe is employed for vaginal injection, or left until the following morning.

If nitric acid be employed it is well to inject a little saturated solution of carbonate of soda into the vaginal cul-de-sac, so as to preclude any of the acid running down and irritating the vagina; any excess of the acid must also be carefully neutralized by the same agent.

In every case the probe should be accurately curved to correspond with the direction of the cervical canal; no force should be employed, lest the tissue of the cervix be injured. To remove the cotton-wool from the probe, with a pair of scissors cut along the convexity of the curve, then dip the end in water and again use the scissors until all the wool be displaced.

Sims devised an instrument by means of which a roll of cotton soaked in any medicated solution may be left within the cervical canal by sliding it off on withdrawal of the probe, similar in construction to Barnes's tent-introducer.

We can thus leave the agent employed longer in contact with the diseased surface, and so ensure a more thorough and lasting application of it. A string attached to the cotton enables the patient to withdraw it in the event of the uterine contractions not expelling it within the course of a few hours.

The same object may be attained, if the operator be an adept, by rolling the cotton lightly on a smooth probe, and reversing this latter as soon as the canal contracts upon it, so as to loosen the hold of the cotton and allow it to remain within the cervix.

The agents most useful in modifying the condition of the cervical canal when affected by endometritis are: Carbolic acid, kept liquid by adding $\mathfrak{z}\text{j}$ of glycerin to $\mathfrak{z}\text{j}$ of the pure crystallized acid, liquefied by heat (a few grains of camphor added to this prevents solidification again, even at a freezing temperature); carbolic acid, liquefied as above, with equal parts of linimentum or liquor iodi; liquor ferri perchlorid. fortior, alone or diluted with an equal quantity of glycerin; acid. nitric. fortior; nitrate of silver solution $\mathfrak{z}\text{j}$ ad $\mathfrak{z}\text{j}$ aquam; chromic acid $\mathfrak{z}\text{j}$ ad $\mathfrak{z}\text{j}$ aquam; linimentum iodi; glacial acetic acid; acid nitrate of mercury.

Frequency of Application.—As a general rule it will be necessary to repeat the application of most of the agents employed about once a week, changing them from time to time. It is always well to begin with carbolic acid, as being less powerful than some of the others mentioned, and less likely to produce contraction or occlusion of the os. Moreover it exerts a marked local anæsthetic effect, and so proves less painful to the patient. It is an extremely

useful agent, and in the majority of simple cases will alone prove sufficient to effect a cure. It may be applied within a few days of the cessation of the menstrual period, then again within a week, and a third time a week after, thus leaving a clear interval of ten days before the expected appearance of the next catamenia.

Iodine, whether in the form of liquor iodi (1 in 24), linimentum iodi (1 in 9), iodized phenol (iodine \mathfrak{z} ss, crystallized carbolic acid \mathfrak{z} ij, water \mathfrak{z} ij = 1 in 5), or linimentum iodi and carbolic acid in equal parts, is a most valuable application. It is not only a local stimulant, but also a powerful alterative, stimulating the absorbents, and being taken up into the general circulation and so producing a double action.

Patients will often detect the taste of iodine within a very short time of its application.

It has the advantage also of not losing its efficacy by frequent employment, and acts promptly in causing contraction of all the blood-vessels within range of its influence.

If carefully used, the combination of the linimentum iodi with liquefied carbolic acid is the most efficacious, and may be safely employed.

Nitric Acid should never be applied to the cervical canal until other remedies have first been employed to test the toleration of caustics, as it sometimes produces a considerable amount of pain with reflex nervous symptoms which may last for some days. It should be reserved for very severe and intractable cases, where other remedies have been tried and failed, and then only applied once shortly after a period, other agents, as a rule, being employed in the interval. If necessary the acid may again be used after the next period, and so on, once a month, for two or three months. It is well to state that the acid causes destruction of tissues and may lead to contraction of the cervix or occlusion of the os uteri. I have met with instances where retention of the menstrual fluid—hæmatometra—has ensued and an operation been requisite to restore the patency of the os uteri.

In appropriate cases, when properly applied and not repeated too frequently, it is unquestionably a very useful application, but should never be employed by those who are not thoroughly familiar with the practice of gynecology.

Liquor Ferri Perchloridi fortior is a very powerful styptic, and in cases where the endometrium is seen to be in a state of extensive granular degeneration, may be applied with benefit, but not too often. It is well to inject a little saturated solution of carbonate of soda into the cul-de-sac of the vagina previously to applying the iron, so as to neutralize any excess that may run down, as it has a very irritating effect upon the vagina.

The acid nitrate of mercury offers no advantages over the nitric acid, and is liable to produce salivation if the patient be at all susceptible.

Chromic acid is even more painful and irritating in its effect than nitric acid, and is less generally applicable.

Glacial acetic acid has been recommended as a painless application in these cases.

Crayons or pencils made of the following substances have been recommended for insertion into the cervical canal either by means of a porte-crayon, Barnes's tube, or by the aid of a speculum and forceps:

Nitrate of silver alone, or reduced by admixture with equal parts of nitrate of potash, fused into moulds. Sulphate of zinc fused, so as to make zinc points. Tannin, one drop of glycerin added to ten grains of tannin, rolled out into a crayon. Iodoform gr. xv, pulv. acaciæ and mucilage quantum suf. made into a cylinder $1\frac{1}{2}$ inch long.

In special cases crayons may be indicated, but they are far less generally useful than the liquid caustics.

The application of the solid nitrate of silver, either by passing the caustic in a holder up the canal or by leaving a small piece to dissolve there, is not to be recommended; the former method is quite inefficient, the latter not unattended by danger, and in any case liable to set up considerable irritation as the dissolved caustic runs down into the vagina. If the case be really one of chronic cervical endometritis, such as we are now considering, the only applications at all likely to be brought into contact with any extent of the lining membrane of the cervix are those in a fluid form, applied by means of a Playfair's probe coated with cotton-wool, sufficiently bulky to distend the canal somewhat and to secure a thorough application of the remedy.

In practice the method of fusing nitrate of silver in a small cup over a spirit-lamp, and then coating a specially constructed probe with it, proves far too tedious to be of anything more than exceptional service.

In very intractable cases of endometritis, where the mucous glands are severely affected, and nitric acid even fails to cure, our only resort is to proceed to the destruction of the glands by still more powerful measures.

The galvano-cautery, as well as the actual cautery, have been employed in these cases, and with success, but there is always a risk of subsequent contraction of the cervix.

Potassa fusa and potassa cum calce are liable to the same objection.

Where the careful application of the nitric or chromic acid fails in destroying the glands, the only way of effecting a cure is by removal of the glands by means of the sharp steel curette.

A second operation may be necessary at some few weeks' interval. It should be undertaken shortly after a period, and the patient confined to bed for a few days, precautions being taken as in any other operation upon the cervix.

CHAPTER XI.

CHRONIC CORPOREAL ENDOMETRITIS.

Chronic Corporeal Endometritis.—This is the term commonly employed to express inflammation of the mucous membrane of the body of the uterus. This latter has been described as being thin, soft, pale, smooth, glandular, and closely adherent to the subjacent tissues. It varies at different periods in thickness, consistence, and vascularity, and may be even absent. Dr. John Williams thinks the mucous membrane of the uterus is of great thickness, a considerable portion of the muscular wall of the organ being formed by muscularis mucosæ, which corresponds to the stratum of muscular fibre-cells resting upon a layer of areolar tissue, termed "submucous," in ordinary mucous membranes.

Pathology.—Bearing these anatomical details in mind, it will readily be understood that the inflammatory process is not confined to the mucous lining of the uterus, but extends to a greater or less extent into the actual substance of the organ. The term endometritis is limited to those cases where the inflammation preponderates in the mucous membrane, that of chronic metritis to those cases where the parenchyma of the uterus is chiefly affected.

In the early stage the mucous membrane is found to be swollen and congested, the uterine wall thickened, and the bulk of the uterus consequently increased. The secretion consists of an alkaline, thin mucous fluid, or when the case is more severe it is muco-purulent, rusty, or sanguinolent. Partial exfoliation of the mucous membrane often occurs, the subjacent tissue being elevated in the form of granulations or villous proliferations, which bleed readily, constituting the disease known as fungoid or villous endometritis. Later on, especially where the inflammation involves the parenchyma of the organ, the mucous membrane becomes atrophied, the utricular glands obliterated, the epithelial covering lost, or the cylindrical or ciliated epithelium replaced by pavement epithelium.

Causation.—The predisposing causes most liable to give rise to chronic endometritis are the strumous diathesis, general debility, exhaustion from parturition or lactation, and prolonged mental depression. Syphilis, in that it interferes materially with the development of the uterine mucous membrane in early pregnancy, must be regarded as an important predisposing cause. Abortion frequently ensues and the membrane remains diseased.

Among the exciting causes may be mentioned exposure to cold during menstruation, with consequent sudden arrest of the flow; extension of the vaginitis, whether simple or specific; cervical

endometritis, acute endometritis and metritis, puerperal or not; retention of portions of decidua, clots, or placenta following abortion or parturition; obstructions to the escape of secretions from flexions or stenosis of the cervical canal; congestions from displacements or the presence of uterine fibroids or polypi, or from the abuse of sexual intercourse; mechanical injuries from passage of the uterine sound, wearing of intra-uterine pessaries, or from attempts to induce abortion; the exanthemata; phthisis.

Sudden arrest of the menstrual flow from exposure to cold during menstruation, at a time when the uterus is in a state of intense hyperæmia, would naturally tend to produce acute endometritis terminating in the chronic affection.

The extension of vaginitis, more especially when of a specific nature, is often witnessed in the newly married, the inflammation extending not only to the cervix and body of the uterus, but also to the Fallopian tubes, involving even the ovaries and setting up acute peritonitis. Dr. Noeggerath has shown that a latent gonorrhœa or gleet in the husband may infect the newly-married wife with a low grade of inflammation, the symptoms of which are not sufficiently acute in the early stage to attract much attention, but which nevertheless eventuate in chronic endometritis and consequent sterility. Abuse of sexual intercourse may in some cases aggravate any lurking uterine disorder and account for the production of endometritis. The acute inflammatory conditions in place of ending in complete recovery may terminate in the more chronic affection.

Retention of portions of the placenta, of the decidua, or of clots, and their subsequent decomposition, may lead to acute septicæmic metritis, which, if the patient survive the attack, may terminate in chronic endometritis, the body of the uterus being chiefly affected.

Obstruction to the escape of secretions from the uterus, whether menstrual or otherwise, from flexion or stenosis of the cervical canal, is probably one of the most frequent causes of endometritis among those who have never been pregnant, as also in virgins. It is in these cases that the mischief is more especially limited to the fundus, the cervix in many cases not being involved. Under ordinary circumstances, when the menstrual blood escapes freely from the uterus, coagulation is prevented by admixture with the acid vaginal mucus, but if retained for any length of time, or in any considerable quantity, in the uterine cavity, it very soon becomes clotted. These clots are unable to pass the constricted cervix; the uterine cavity thus becomes distended; expulsive pains described as spasms or colic are induced. The accumulation meanwhile undergoing more or less decomposition sets up irritation and inflammation of the lining membrane of the body. When expulsion is at length effected, it is apt to occur with a rush, the patient perhaps stating that an abscess or gathering in her inside suddenly burst, after which the pain subsided.

In membranous dysmenorrhœa, where the lining membrane of the body of the uterus is expelled in one piece, or in shreds, the

menstrual decidua not undergoing complete disintegration, violent expulsive pains are often induced, similar to those we are now considering.

In cases of flexion or stenosis the discharges are not infrequently exceedingly offensive, causing much irritation in their passage over the vagina and vulva, in some cases setting up a blenorrhagic discharge in the wall and leading to the supposition of unchastity in the female.

Cases of septic peritonitis or septicæmia are occasionally witnessed from escape of the decomposing secretions through the Fallopian tubes into the peritoneal cavity.

Mechanical injuries are too often responsible for attacks of endometritis, more especially if any tendency to inflammation previously existed.

Symptoms.—These vary very considerably. In some instances they are so slight, or so masked and obscure, as not even to excite the suspicion of the patient, or her medical attendant, of anything being amiss. Sometimes the disease may exist for years, the only evidence of it being leucorrhœa, menstrual disorders, and nervous derangements; at others displacement, with dysmenorrhœa, dyspareunia, pruritus vulvæ, and serious inconvenience may result, rendering the patient's life one of continued discomfort.

The most prominent and most frequent symptom of corporeal endometritis is leucorrhœa. This is either a profuse glairy mucus, much less viscid than that occurring in cervical endometritis, or an acrid muco-purulent secretion which irritates the passages and gives rise to the most troublesome pruritus vulvæ. A peculiarity of the discharge is that it is often stained with blood and resembles the rusty sputa so characteristic of pneumonia, more especially shortly after a menstrual period, leading the patient to regard it as a prolongation of the catamenia.

In elderly women who have passed the climacteric, the discharge is more of a watery or creamy purulent character. It is in these cases, when stenosis of the cervix occurs, that accumulations of fluid in the interior of the uterus take place—hydrometra. In some instances the pent-up secretion suddenly escaping gives rise to the supposition that an abscess has burst.

Menstrual disorders, such as menorrhagia, dysmenorrhœa, or irregularity are commonly noticed in the early stages. In the fungoid variety of endometritis, profuse and often intractable hæmorrhage is often the prominent symptom. Dysmenorrhœa is frequently more marked in the latter stages, when induration of the uterine tissue and degeneration of the mucous membrane have taken place, menstruation being scanty and not infrequently ceasing prematurely. In some cases exfoliation of the entire lining membrane of the uterus occurs, the so-called dysmenorrhœal membrane.

Sterility is an almost invariable result of endometritis, in many cases being the only symptom that has induced the patient to submit to a local investigation. This is partly due to the leucorrhœal

discharge proving inimical to the life of the spermatozoa, and partly to the diseased condition of the lining membrane precluding the normal development of the ovum.

Pain is almost invariably present, its intensity, varying in different patients, depending upon their susceptibility to its influence as well as upon the extent of the uterine tissues involved. Dragging pain in the back, groins, and hypogastrium, often extending down the inner sides of the thigh, is usually experienced, worse on standing, walking, or coitus. In the large majority of cases the pain is worse on the left side, the reason of which is difficult to explain, unless it be the distention of the rectum pressing upon the tender and often inflamed ovary.

The uterus itself is generally tender on pressure, much distress being often experienced from the bearing-down efforts made when the bladder or rectum is relieved, as well as from the passage of hardened fæces through the rectum pressing upon the inflamed uterus.

Dysuria, frequent micturition, and even cystitis are not infrequently observed. As a rule the bowels are constipated, but diarrhœa may alternate with this condition.

Nervous disturbances of one kind or another are almost invariably present in cases of chronic uterine catarrh. Headache, limited more or less to the vertex, of a neuralgic character, is almost characteristic of this condition. The patient becomes fretful, despondent, and hysterical, crying upon very slight provocation, and is quite incapable of concentrating her attention or of undergoing any prolonged mental effort. In severe cases, where any hereditary tendency to such affections exists, hystero-epilepsy, epilepsy, or melancholia may ensue.

Minor neuralgic pains are often experienced, along the edge of the false ribs extending up to the shoulder; in the right hypochondriac region, leading to the supposition of the liver being affected; under the left mamma; down the inner side of the thighs; in the soles of the feet, and in other unexpected positions.

Disorders of nutrition are generally well marked; the appetite becomes impaired, capricious, and even entirely wanting, the patient loathing the sight of food; nausea, vomiting, eructation, gastralgia, flatulent distention of the abdomen—meteorism—with dyspepsia, are often most distressing, in some cases leading to the supposition of pregnancy—pseudo-cyesis or spurious pregnancy. The urine frequently becomes turbid, loaded with phosphates or lithates. The bowels are generally confined, occasional attacks of diarrhœa alternating with this condition. In some cases, owing to the constant discharge and impaired nutrition, the body becomes more or less emaciated, dark areolæ form around the orbits, the complexion becomes muddy or sallow, the countenance dull and apathetic, and the so-called *facies uterina* developed.

Disorders of the skin and its appendages are not infrequently observed, such as pigmentation on the forehead or abdomen, around the orbits or the nipples; eczema and acne are often very trouble-

some. Hyperæsthesia of the skin and mucous membrane is occasionally noticed in the form of pruritus vulvæ and vaginæ. The hair of the head also is apt to fall out and become very thin.

Certain reflex neuroses have been observed as complicating chronic endometritis, such as asthma, bronchitis, amaurosis from chronic optic neuritis, partial or complete paraplegia.

Diagnosis.—In cases of uterine leucorrhœa it is important to distinguish cervical endometritis proper from corporeal endometritis, as also to determine whether the two affections are present at the same time, the treatment of the two conditions varying in many important particulars.

In corporeal endometritis the discharge is more of a mucoid or muco-purulent character, and not infrequently of a rusty tint. The uterus is increased in size, the sound entering beyond the normal distance producing pain on reaching the fundus and slight hæmorrhage on withdrawal. On conjoined manipulation the uterus is found to be bulky and very tender. Menstrual disorders are frequent.

In cervical endometritis the discharge is thick, glairy, tenacious, adhering to the cervical canal; there is little or no pain or tenderness of the body of the uterus. Menstrual irregularities are seldom marked, and nervous disturbances are far less frequent than in the former affection.

Prognosis.—Chronic endometritis, if recognized early and treated actively, may possibly end in recovery, but in by far the larger number of cases, although some partial improvement may take place, the disease is practically incurable and resists every plan of treatment.

The prognosis is more favorable in recent cases, where the discharge consists chiefly of mucus and is not purulent, where no displacement of the uterus exists, where the patient is naturally of a strong constitution and the general health has not been broken down. Where, however, the case is one of long standing, the discharge is muco-purulent, displacement of the uterus exists, the cavity is increased in size, the constitution is naturally feeble or the general health has been shattered by prolonged suffering, there is very little hope of improvement, and relapses are very liable to occur.

Treatment.—Chronic endometritis is one of the most obstinate and intractable disorders we are called upon to treat. Before attempting any active or heroic treatment we should first familiarize ourselves with all the details as to the history, apparent cause, duration, severity, complications, toleration of interference, and anything at all calculated to assist us in our management of the individual case.

If there be evidence of previous attacks of peritonitis or cellulitis, if the patient be unable to rest up and take proper care of herself, or if there has been hitherto marked intolerance of interference, we should be extremely careful in resorting to active treatment. Every possible complication calculated to keep up or aggravate the

condition should, as far as practicable, be removed. If any granular degeneration of the cervix be present, this must first be attended to in the manner described. If cervical endometritis exist, appropriate treatment must be resorted to. If the os uteri be constricted, this should be enlarged by a crucial incision.

If any marked displacement be detected, more especially if it be retroversion or retroflexion of the uterus or prolapse of this organ, a vaginal pessary should be inserted as soon as it is considered probable that it will be tolerated. Any inflammation or engorgement of the uterus should first be relieved by local depletion, rest in the recumbent position, the hot-water douche, glycerin tampons, the administration of saline aperients, bromide or iodide of potassium, and other appropriate drugs.

The general health should be improved as much as possible by attention to diet, exercise, recreation, regulation of the secretions, and everything likely to conduce to the end in view. The diet should be simple and nutritious, at the same time not too restricted, as the appetite is generally deficient or capricious. Alcohol, in strict moderation, may prove of service in assisting digestion if taken at meal times, but should never be allowed to replace food or to be taken at odd times if the patient feels low or sinking. In many cases it will be found better to limit the quantity very strictly or to enjoin total abstinence, at least for a time, if, as not infrequently happens, there is a marked predisposition to abuse the employment of stimulants.

As treatment, to be effectual, will occupy several months at least, the patient should on no account be confined to bed or to the couch, nor even to the house. Regular exercise, short of fatigue, should always be enjoined—walking, driving, or riding, according to circumstances. It is prudent even to intermit treatment for a time and let the patient go to the seaside or to the country for a change, or in some instances to one or other of the spas where she can take the mineral waters containing iodine, bromine, iron, etc. It is not absolutely necessary to compel our patient, if married, to lead a single life, but it is well to suggest extreme prudence in this particular, more especially during the time active treatment is being pursued. Every effort should be made to distract the patient's attention from herself, and to encourage her to look at the bright side of things. The practitioner who can not only inspire confidence but encourage hope of ultimate recovery is far more likely to succeed than another who regards it as a foregone conclusion that no treatment will be of any avail.

Medicinal tonics are often of service in improving the appetite, such as the nitro-hydrochloric acid, with nux vomica and cinchona; the hydrobromate of quinine, arsenic, strychnia, and other similar agents. Iron is seldom tolerated if much local tenderness be present or the tongue be coated, showing the liver is not acting well, until these conditions have been relieved; but where the general health is much deteriorated the citrate of iron and quinine or other preparation sometimes proves of much service.

Basham's mixture of liq. amm. acet. \mathfrak{z} iss, acid. acet. dil. \mathfrak{z} ss, tinct. ferri perchl. \mathfrak{z} ij, syrupi \mathfrak{z} iss, aquam ad \mathfrak{z} vj, is a very agreeable and efficacious combination. One tablespoonful with two of water thrice daily.

Another useful form is mag. sulphat. \mathfrak{z} ss, acid. sulph. dil. \mathfrak{z} j, tinct. ferri perchl. \mathfrak{z} ij, tinct. nucis vom. \mathfrak{z} ij, syr. zingib. \mathfrak{z} iss, aquam ad \mathfrak{z} vj. Dose, \mathfrak{z} ss in water thrice daily.

Some prefer liq. amm. cit. \mathfrak{z} iss, acid. phosph. dil. \mathfrak{z} ij, tinct. ferri perchl. \mathfrak{z} ij, syrupi limonis \mathfrak{z} iss, aquam ad \mathfrak{z} vj. Dose, \mathfrak{z} ss in water thrice daily. This makes a very pleasant mixture.

Bland's pills have been highly extolled by Meineyer. They consist of pulv. ferri sulph. exsic., pot. carb. puræ, $\mathfrak{a}\mathfrak{a}$ \mathfrak{z} ij, syrupi, q. s.—Fiat mass; div. in pil. xlviii. Dose, one pill after each meal, gradually increased to three after each meal.

Where endometritis follows parturition and a certain amount of subinvolution co-exists, it will be well to give ergot in combination with bromide of potassium, etc. Ext. ergot. liq. \mathfrak{z} ss, pot. bromid. \mathfrak{z} ss, tinct. cinch. co. \mathfrak{z} ss, tinct. chlor. co. \mathfrak{z} ij, syr. aurantii \mathfrak{z} iss, aquam ad \mathfrak{z} vj. Dose, \mathfrak{z} ss in water thrice daily.

This will tend to check any menorrhagia and produce a healthier condition of the organ.

Arsenic in some cases acts very beneficially as a nervine tonic.

Strychnia is one of our best tonics, and in many cases may replace ergot.

Where any specific history be detected, it will be well to administer some such mixture as the following: Liq. hydrarg. perchl. \mathfrak{z} j—iss, potass. iodid. \mathfrak{z} ss—j, potassii bromid. \mathfrak{z} ij—iv, spr. amm. arom. \mathfrak{z} ss, glycer. purif. \mathfrak{z} j—iss, aquam ad \mathfrak{z} vj. Dose, \mathfrak{z} ss in water thrice daily after meals.

It is of great importance to secure regular relief to the bowels. Where attention to diet proves inadequate, there are various methods we may resort to for this purpose. Half a tumblerful of cold water, a wineglassful of the Hunyadi Janos, Friedrichshall, or other mineral water, with the same amount of warm water, taken on first rising, or half a teaspoonful of Carlsbad salts, a Seidlitz powder, or an appropriate dose of any of the saline aperients, may first be tried, but should not be taken too frequently.

The compound liquorice powder of the Prussian Pharmacopœia proves invaluable in many cases, and has the great advantage of not losing its effect by repetition. It is composed of pulv. glycyrrh. rad., pulv. sennæ, $\mathfrak{a}\mathfrak{a}$ \mathfrak{z} ss; sulphur. sublim., pulv. fœniculi, $\mathfrak{a}\mathfrak{a}$ \mathfrak{z} ij; sacchar. purif. \mathfrak{z} iss. One teaspoonful in half a teacup of milk or water at bedtime acts as a gentle aperient.

Pills are often preferred by patients. A very useful form is Ext. aloes aquosæ gr. xii, ext. bellad. gr. iij, pil. rhei co. gr. xxiv.—M., div. in pil. xii, cap. j, pro re nata. Another rather stronger is Ext. aloes Socrot. gr. xii, ext. nucis vom. gr. iij, pil. colocy. et hyosey. gr. xxiv.—M., et div. in pil. xii. The pil. aloes et assafœtidæ, aloes et myrrhæ, rhei co., etc., are often useful. The confection of senna or of sulphur acts well in some cases.

The habit of indulging in tea, so prevalent among some patients, aggravates materially the tendency to constipation, and should therefore be restricted.

Enemata of cold water are often of more service than even aperient medicine in securing a daily evacuation. Warm water is less efficacious. Soap and water is more stimulating, but plain water is generally sufficient.

Where pain is a prominent symptom, the menstrual periods being attended by great discomfort, much inconvenience being caused by local applications, or the patient is restless at night and unable to procure sleep, we must be prepared to suggest some efficient relief.

It is well to avoid as far as possible resorting to the employment of opiates until other methods have first been tried.

A warm hip-bath at bedtime has often a very soothing influence, its effect being materially increased by combining with it the hot vaginal douche. By means of a syringe, syphon, or irrigator, a continuous stream of hot water, commencing at a temperature of 95° F. and gradually increasing this up to 110° F., may be injected into the vagina continuously for ten or fifteen minutes. This not only allays nervousness and restlessness, but produces contraction of the vessels and promotes absorption, thereby diminishing the bulk of the uterus.

In some cases a tablespoonful or two of mustard diffused in the bath-water increases the soothing effect of the hip-bath and tends to promote sleep.

As sedatives proper we have a long list to choose from, and it is well to have several to fall back upon, inasmuch as some patients are intolerant of one remedy, but can take another readily. By constant repetition one drug may lose its beneficial influence, and will therefore need to be changed from time to time.

Bromide of potassium in scruple doses twice or thrice daily, given in some aromatic infusion, such as the *inf. aurantii co.*, *calumbæ*, *caryophylli*, *chirate*, *gentianæ co.*, etc., proves most valuable in all cases of nervous disturbance due to uterine irritation.

Bromide of ammonium in scruple doses acts in a similar manner, and is especially indicated where headache is a prominent system.

Bromide of camphor in four-grain doses three or four times a day has been strongly recommended. It may be made into pills with the *ext. taraxaci*, or Dr. Clin's capsules, which contain four grains in each, may be given.

Belladonna is a powerful narcotic. Given in one-quarter grain doses of the extract, twice or thrice daily, gradually increasing the dose, as suppository containing one to two grains, or applied to the abdomen in the form of the extract rubbed down with glycerin, it proves very useful. It acts specially upon the sympathetic system, and is indicated whenever there is any vesical tenesmus.

Camphor in five to ten grain doses, dissolved in rectified spirit or ether and given on a lump of sugar or in milk, exerts a valuable

sedative as well as anaphrodisiac effect, promoting diaphoresis and allaying nervous irritation. Some patients prefer keeping a small lump in their pocket and nibbling it from time to time.

Chloral in scruple doses at bedtime, or combined with camphor or bromide of potassium, is very useful in procuring sleep.

Cannabis Indica in quarter-grain doses of the extract, gradually increased to one grain, in the form of pill, or as a mixture containing five to fifteen or twenty minims of the tincture with mucilage, often agrees when opium is not tolerated. It acts as a soporific or hypnotic in conciliating sleep, as an anodyne in calming irritation, as well as a nervine stimulant in removing languor and anxiety. It has no constipating tendency and leaves no unpleasant after-effects, as too often happens with opium. It exerts a special influence in cases of neuralgia and headache, as well as being a general sedative.

Conium is a powerful narcotic and anodyne, as well as a sedative to the sexual organs. The succus conii in ʒj-ij doses is the best mode of administering the drug, but it may also be given in the form of the extract as suppository or as pill.

Hyoscyamus is intermediate in its action between opium and belladonna, acting as a narcotic and exerting an influence upon the sympathetic nervous system secondary only to that possessed by belladonna itself. It increases the hypnotic action of opium, and also prevents the constipating effects of the latter. It may be given in the form of pill in doses of two or three grains of the extract, either alone or combined with camphor or opium.

Opium in some form or another in many cases will be found to be requisite. At first we should try suppositories either of the extract. opii (gr. ss-j); morphia (gr. $\frac{1}{3}$ -j); morphia (gr. $\frac{1}{3}$) and atropin (gr. $\frac{1}{60}$ - $\frac{1}{20}$); or tinct. opii (ʒxx-ʒj) and starch enema. A drachm of laudanum with twice the quantity of glycerin may be used to saturate a tampon, which is then passed up the vagina as far as the cervix.

The hypodermic injection of morphia (gr. j. ad ʒvj), two to three minims of the solution being sufficient to commence with, may be used; but its employment should never be commenced unless the practitioner is prepared to go on with it regularly, the patient soon becoming so dependent upon it as to make the injection at stated intervals a very irksome duty.

The stomach should never be employed as the vehicle for the administration of opium until other methods have been exhausted. A pill of quinine (gr. j-ij) and opium (gr. $\frac{1}{3}$ -1 of the extract) with ext. belladon. (gr. $\frac{1}{4}$ - $\frac{1}{3}$) to obviate constipation, is a useful form; Dover's Powder (gr. x = gr. j. of opium); liq. opii sed. (ʒxv-xxx) with spir. æth. sulph. (ʒxxx-lx) in form of a draught, or any of the numerous combinations found useful under special circumstances, may be given. The practitioner will need to vary his prescriptions, and may try in turn, fomentations, lotions, linaments, ointments, pills, draughts, plasters, and suppositories.

Counter-irritation will generally be found of service in relieving

pain, as also in allaying vomiting and checking tympanitic distention.

Mustard poultices and turpentine stupes to the abdomen, linimentum ammoniæ, camphoræ, crotonis, saponis co., or terebinthinæ, rubbed in over the seat of pain, and a poultice subsequently applied, or sprinkled on spongio-piline and kept applied for six or eight hours, will often be of service.

The liquor epispasticus may be painted over a surface as large as a five-shilling piece, so as to produce a flying blister, and repeated when necessary. The linimentum aconiti c. opio, belladonnæ, chloroformi, or the two latter in equal proportions, will often produce a marked sedative effect. Patients often derive great comfort from plasters applied to the back, kept on for several consecutive weeks, or renewed as often as necessary. Of these the emplastrum belladonnæ, calefaciens, or roborans are generally most serviceable. The direct application of counter-irritation to the cervix uteri by means of linimentum iodi or even strong caustics, in many cases proves even more efficacious than when applied externally.

Intra-uterine Medication.—This should never be undertaken unadvisedly, as it is by no means unattended by risk. Dr. Thomas, of New York, in his last edition says: "Observation and experience have so changed my own practice, that I find myself very rarely resorting at present to applications above the os internum uteri." The various methods employed are: 1, swabbing the interior of the uterus with strong solutions of caustic; 2, passing ointments up into the cavity and allowing them to melt there; 3, injecting fluids into the cavity of the uterus; 4, passing solid caustics into the uterus and allowing them to dissolve there.

The first method, viz., swabbing out the interior of the uterus with strong solutions of caustic, is that most usually followed, being the most convenient, and attended by less risks than injecting fluids into the cavity.

Preliminary treatment, to lessen congestion, remove constriction, and secure patulousness of the cervical canal, should always first be resorted to. In cases where cervical endometritis is marked, but the symptoms lead to the conclusion that the body of the uterus is also affected, it may be well to commence treatment by passing a Playfair's probe properly coated and charged, rapidly through the cervix, leaving it in sufficiently long for the uterus to contract upon, and squeeze out the fluid, so that it may come in contact with the interior. Where, however, the mischief is chiefly confined to the body of the uterus, the cervix not being involved or already cured by previous treatment, it will be necessary to protect this latter canal by means of a delicate cervical speculum or intra-uterine canula, so as to prevent the fluid being squeezed out in passing, and also to prevent the cervix contracting forcibly on the probe, and so shutting off the channel of exit for the fluid. The speculum may be made of platinum or vulcanite; a long handle should be attached to this so as to hold it in position when

inserted. Its introduction will be facilitated by having a guide as well. The patient being placed in the semi-prone position, and Sims's or a short cylindrical speculum employed, the cervix is cleansed if necessary, and the canula inserted. Any further accumulation of mucus is then removed by a long probe coated with cotton-wool, and Playfair's probe, duly coated and charged, is then inserted through the canula, and the interior of the body of the uterus swabbed over. The canula is then withdrawn, any excess of the agent carefully neutralized, and a tampon soaked in glycerin passed up to the vaginal cul-de-sac. The fluids best calculated to alter the condition of the endometrium and to cure the disorder are:



Atthill's Canula for Intra-uterine Medication.



The same, showing canula and stilette separated.

Acid, carbolic., either saturated solution or diluted with an equal quantity of glycerin.

Iodine, in form of strong tincture or liquor iodi.

A combination of equal parts of the liquor iodi and carbolic acid.

Solution of nitrate of silver, \mathfrak{Dj} - \mathfrak{Sij} to $\mathfrak{5j}$ of water.

Solution of chromic acid, $\mathfrak{5j}$ to the $\mathfrak{5j}$ of water.

Tincture of the perchloride of iron, alone, or with equal parts of glycerin.

Liquor ferri perchloridi fortior, alone, or diluted as above.

Acid. nitric. fortior.

The relative merits of these various agents have already been considered when speaking of cervical endometritis.

Carbolic acid is probably the safest and most reliable agent in ordinary cases. Iron is most serviceable in cases of hæmorrhage.

Nitric acid has been strongly recommended in severe cases, more especially where the hæmorrhage is very profuse, the discharge purulent or muco-purulent, and other remedies have failed to afford relief. Its application; however, should never be lightly undertaken, as in unskilled hands it is liable to produce most serious symptoms. Under any circumstances it should only be employed shortly after a menstrual period, and not repeated until every trace of irritation set up has subsided. In cases where the application of the acid is indicated, the cervical canal is sufficiently patulous without having to resort to artificial dilatation by means of tents, a procedure always to be avoided where possible.

Another method of applying astringents, caustics, solvents, or alteratives to the interior of the uterus, is in the form of ointment or pasma. In this way almost any substance may be applied. Where grease is objectionable as a vehicle, a pasma of suitable consistence may be made by glycerin, vaseline, or other substances.

In this form we may use remedies which cannot easily be applied in any other way. For instance, we can hardly use bromide, or iodine, or mercury in a solid shape.

The uterine ointment-positor consists of a long silver, nickel, or vulcanite catheter, having two long eyelet-holes at the end, and a conical, well-fitting piston or rod. It is charged by dipping the end into the ointment, any superfluity being wiped off. It is then passed through the os uteri without the aid of the speculum, the piston is pushed home, and the ointment thus deposited in the interior of the uterus. Ointments composed of iodide of mercury or lead; nitrate of silver ʒij, ext. bellad. ʒj, ung. cetacei ʒj; acetate of lead ʒij, morphia gr. iv, ung. cetacei ʒj; bismuthi ʒij, ung. zinci ʒj, or any other agent desired, may thus be employed.

Intra-uterine injections should be restricted within the narrowest limits on account of the danger of the fluid finding its way along the Fallopian tubes and so causing death by shock or peritonitis. Numerous fatal cases have been recorded. Many of our leading men rarely employ them now, except in cases of urgent danger from metrorrhagia. Although, in experienced hands, when proper precautions are taken, the danger may be slight, yet in careless, inexperienced, or unskilful hands, the perils are very great. The operation should therefore never be undertaken by any one who is not thoroughly familiar with the details, only acquired by much practice, of the treatment of uterine disorders. Dr. Bennet believes that serious accidents would be far more common "were it not that the natural coarctation of the os internum must have generally prevented the fluid injected from penetrating into the uterine cavity."

The danger of employing intra-uterine injections consists generally in the fluid finding its way along the Fallopian tubes, either from the force with which the fluid is injected or from the spasmodic contraction of the uterus closing the channel of exit around the tube and thus driving the fluid onward. Where the tubes are in a healthy condition the entrance of fluids is resisted, but where they are unduly dilated, as occurs from salpingitis, fluid readily enters.

The general conclusion arrived at by most gynecologists is that uterine injections should not be resorted to except in cases of uncontrollable hæmorrhage, their employment being likely to cause very dangerous symptoms, such as severe uterine colic, collapse, and peritonitis. In severe, obstinate, and protracted cases of endometritis, more especially where menorrhagia is a prominent symptom, we are, however, compelled occasionally to resort to this method of treatment, inasmuch as the cavity being enlarged the swab cannot be applied to the whole of the surface, nor can sufficient quantity of the agent employed be inserted into the uterus to arrest the hæmorrhage.

To lessen the risks of danger as much as possible, the following points should be attended to:

Avoid injecting unless the cervix be well dilated, either naturally or artificially, so that the fluid can escape readily. A double

canula, so as to secure a return current, is advisable, though this does not absolutely guarantee safety, inasmuch as the aperture intended to serve for the return current may become blocked by clot or coagulated albumen.

Never inject when a menstrual period is pending or present, nor if there be evidence of recent pelvi-peritonitis or cellulitis.

In cases of marked flexion this must be first reduced, and care taken that the canal is patulous at the angle of flexion, the fluid being again withdrawn into the syringe within a short period from its injection.

Before using strong solutions, wash out the cavity of the uterus first with warm water, slowly and carefully injected, taking special precaution to exclude any air from the syringe, so as to test the tolerance of the uterus.

The solution selected must be injected by an appropriate instrument, in graduated quantities, very gently and slowly.

The solutions employed are chiefly the following:

Tincture of iodine diluted with equal parts of water, or stronger, as in Churchill's tincture (iodin. $\mathfrak{z}\mathfrak{j}$, pot. iod. gr. xii, alcohol. $\mathfrak{z}\mathfrak{j}$).

This acts as a stimulant, alterative, counter-irritant, caustic, and hæmostatic.

Acid. carbolic. crystallized, dissolved in equal quantity of glycerin or diluted still further with water.

It does not cause pain, nor does it cauterize or destroy tissue.

Sulphate of zinc gr. x ad $\mathfrak{z}\mathfrak{j}$ aquam.

Tinct. ferri perchlor. $\mathfrak{z}\mathfrak{i}\mathfrak{j}$ -iv ad $\mathfrak{z}\mathfrak{j}$ aquam.

Acid. chromic. $\mathfrak{z}\mathfrak{j}$ -ij ad $\mathfrak{z}\mathfrak{j}$ aquam.

Acid. nitric. after other remedies have been tried and failed has been employed, but is safer when used with the swab.

Nitrate of silver should not be used for intra-uterine injections, as even in weak solutions it gives rise to violent uterine colic, often of long duration.

The method of injecting fluids into the cavity of the uterus is as follows: A small india-rubber ball syringe with a pointed nozzle is fitted on to a long gum-elastic catheter, about No. 8 or 10 size, with several small openings at the distal end. This is carefully filled with warm water, the end of the tube held uppermost and every particle of air expelled, the ball being completely filled before using it. Having inserted the end of the catheter within the uterus, the water is very gently and slowly injected. If any severe pain or colic be induced, the water is at once sucked up again, or the catheter withdrawn and the fluid allowed to follow, or the ball removed, the tube remaining in to facilitate expulsion of the fluid.

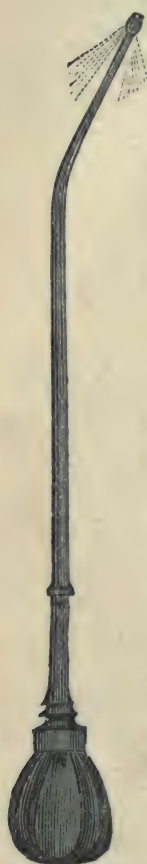
Molesworth's double canula and bulb syringe is a very convenient instrument for this purpose.

A small glass syringe attached by means of a piece of tubing to a long tube or catheter answers the purpose.

Where strong solutions are employed, ten or twelve drops are quite sufficient.

Injectations into the uterus should never be attempted unless the patient be in bed, where she should remain until all risk from the operation has passed over.

FIG. 98.



Vulcanite Intra-uterine Syringe, with recurrent stream.

If any pain be produced, give opium. The hypodermic injection of morphia relieves any uterine colic more certainly and more rapidly than any other method.

The first injection should be given a few days after the menstrual period, warm water being first tried to test the tolerance of the uterus. If strong solutions be employed they should not be repeated for a week or ten days, and, as a rule, only twice during the intermenstrual period.

The fourth method, of passing solid caustics into the uterus and allowing them to dissolve there is not one to be recommended. Nitrate of silver has been thus employed; it often gives rise to intense agony and hæmorrhage. When reduced by fusing it in moulds with equal parts of nitrate of potash, it is less dangerous. The sulphate of zinc points have been employed in a similar manner. Persulphate of iron, tannin, alum, chlorate of potash, and other agents may also be used, made into crayons with mucilage or glycerin.

A long tube with a piston, open at the extremity, is employed to deposit these within the uterus without the aid of the speculum. Simpson's porte-caustique or Barnes's canula is used for this purpose.

A long probe roughened at the extremity and coated with fused nitrate of silver may be tried, but it is a tedious process and very inferior to strong solution.

Fungoid or Villous Endometritis is really a severe form of chronic endometritis, resulting from shedding of the superficial layers

of mucous membrane of the uterus, and by irregular proliferation villous or polypoid masses are developed. Under the head of uterine fungosities Thomas includes these fungous projections from the endometrium, the result of prolonged congestion from any cause, or of the organization of portions of placenta remaining attached to the surface. As the symptoms and treatment of the two conditions are identical, and there is no means of differentiating one from the other, we think it better for practical purpose to consider them together. He speaks of the affection as one of great frequency, one which plays the part of an important factor in menorrhagia and metrorrhagia, and which often saps the health

FIG. 99.



Simpson's Uterine Scoop.

of patients in whom its existence remains for years unsuspected. When resulting from prolonged congestion, they are found to consist of hypertrophied elements of the mucous membrane, dilated follicles, enlarged blood-vessels, and exaggerated cell-growth. Emmet states that the favorite seat for these is in one or both cornua of the uterus, from which cause their presence is frequently overlooked.

Causation.—Any condition which keeps up engorgement of the uterine lining membrane tends to produce them, such as endometritis, laceration of the cervix, subinvolution, displacements, or the presence of submucous or interstitial fibromata. Where abortion or parturition at full term precedes their appearance, they are generally traceable to retained portions of adherent placenta.

Symptoms.—Uterine hæmorrhage is the chief and often the only symptom. There may be also some uterine leucorrhœa, and incidentally spanæmia and sterility. In some cases the fungosities are thrown off during menstruation, but generally remain, neither increasing nor diminishing for years, annoying and weakening the patient until the menopause.

Treatment.—Removal of the growths by means of the blunt wire curette can be readily effected, provided the cervix be patulous enough to admit it. Recamier's sharp curette is too dangerous an instrument to be employed. The copper wire loop, slightly flattened at its edges, devised by Thomas, is a far safer instrument. It removes the growths by looping them off, not by cutting or tearing the endometrium. The operation is a very simple one; it is not usually necessary to produce anæsthesia, but the patient should remain perfectly quiet in bed for three or four days in order to avoid any risk of secondary hæmorrhage, peritonitis, or pelvic cellulitis. Simpson employed a scoop, as in Fig. 99. Emmet prefers a pair of forceps with cutting edges. The great advantage of the instrument is that it can remove only what projects above the common level. This it crushes off sufficiently close, without dragging upon or injuring the surrounding tissues. As a rule the cervical canal is sufficiently patulous to admit of the passage of the curette forceps, but if further dilatation be required, the judicious use of the forceps themselves will frequently accomplish it. Before introducing the forceps, the uterus must be gently drawn down near the outlet by means of a tenaculum caught in the anterior lip. The forceps having then been introduced, the blades are to be gently separated, then closed firmly together, and withdrawn, the operation being repeated until the whole surface has been systematically passed over. The canal is then gently washed out, so as to remove all the *débris*, and a free application of iodine to the fundus made to excite contraction of the uterus.

In cases where the cervical canal is not sufficiently patulous, a ponge-tent may be passed. This serves as a temporary plug to arrest hæmorrhage, often destroys the growths by entangling them in the meshes of the sponge, and in any case facilitates further treatment, if necessary, by means of the curette or the application of nitric acid or other strong caustic.

CHAPTER XII.

SUBINVOLUTION, HYPERTROPHY, AND HYPERPLASIA OF THE UTERUS, OR
CHRONIC METRITIS.

Subinvolution, Hypertrophy, and Hyperplasia of the Uterus, or Chronic Metritis.—In thus grouping together what may at first sight appear to be distinct and separate conditions, it will be found as we proceed that they are in reality but stages of the same affection and will be best considered together, not only to avoid needless repetition, but also to prevent confusion.

Subinvolution is the initiatory stage of a large majority of the cases where on examination a congested, voluminous, tender, displaced uterus is found, a condition hitherto generally described as chronic metritis.

Pathological Anatomy.—In the early stages of subinvolution following parturition, hypertrophy of the muscular structure equally with that of the connective tissue may be found, but later on, in the large majority of cases, on microscopic examination, the amount of fibrous tissue preponderates over that of the muscular fibre. This condition is due almost invariably to interference with the retrograde metamorphosis occurring in the puerperal uterus. Within a few days of parturition the fully-developed muscular fibre undergoes a fatty degeneration, the fatty globules being absorbed and the uterus thus rapidly diminishes in size and weight. Should any untoward influences retard or check this process, and the organ remain flabby and large, we get what is termed a condition of subinvolution, or arrested retrograde evolution. At first the tissue is softer than normal, owing to infiltration with serum, but as Thomas points out, “in process of time the uterine walls diminish in size, their tissue grows less vascular, the blood-vessels become smaller, and the uterine cavity assumes smaller dimensions. But the organ does not assume its original size; it remains large, dense, firm, and sensitive; for years presenting the characteristic appearances of the so-called chronic parenchymatous metritis.” The condition may arise without any evidence whatever of any preceding inflammatory process. Gallard even speaks of the commencement of chronic metritis as being so insidious that it is often difficult to determine its date in each particular case, this acute stage often passing unnoticed among the sequelæ of labor.

How much more reasonable to look upon this condition as depending upon arrest of involution of the puerperal uterus than to regard it as the termination of a latent, undemonstrative, acute inflammation, the symptoms of which were so obscure as not even have been observed.

Dr. Thomas has directed special attention to this condition, described by him as areolar hyperplasia, and which until very recently was regarded as chronic parenchymatous metritis, but, as he justly observes, "cases which were formerly regarded as instances of inflammation, on account of the existence of enlargement, congestion, and tenderness upon pressure, the microscope now proves to have been instances of excessive growth of the connective tissue of the uterus, with congestion and resulting hyperæsthesia of its nerves." The tendency of modern pathologists is evidently to regard the subject from a similar standpoint.

Klob asserts that "diffuse growth of connective tissue constitutes the so-called induration, hitherto considered as a result of parenchymatous inflammation of the uterus, and that it arises from over-excitation of the vaso-motor and excito-nutritive nerves, a formative irritation as it were." Even when increase of the muscular substance occurs, that of the connective tissue considerably predominates.

Causation.—The uterus is more liable to alteration in size, within strict physiological limits, than any other organ in the body. From a normal weight of little more than an ounce in the virgin state, it becomes developed during pregnancy to such an enormous size as to weigh as much as twenty-eight ounces, returning again after parturition to almost its normal size within six or eight weeks, in a state of health. Should any circumstances interfere with this process of involution, this retrograde metamorphosis of the puerperal uterus, we then have the condition termed subinvolution, which is an occurrence of very great frequency, and constitutes the chief cause of all chronic uterine disorders.

In order that the process of involution may proceed naturally it is requisite that the supply of blood to the organ should be materially diminished, and that the process of absorption should go on actively. Anything that interferes with either of these conditions will therefore predispose to subinvolution. If the general health be much depreciated, whether from constitutional weakness, tendency to scrofula or tubercle, prolonged nervous depression, frequent parturition, or other similar causes, the tone of the muscular system is lowered, and the usual rhythmical contractions of the uterus are too feeble or too infrequent to effectually diminish the blood-supply to the organ. If lactation be not performed this defect is still further increased, the application of the child to the breasts producing well-marked contractions of the uterus by reflex stimulation.

It is essential also for the process of absorption that the body be in a state of health; where the system is enfeebled by constitutional debility or other depressing causes, nutrition and the due interchange of waste and repair do not occur as actively as in health.

Apart from these predisposing causes, other exciting causes are often present, such as retention of a portion of the placenta, membranes, or clots, which keeps up a state of active hyperæmia and so favors subinvolution.

Laceration or bruising of the cervix during parturition, inflammatory conditions of the uterus or adjacent tissues following parturition, will also prove exciting causes.

The mere act of getting up too soon after delivery, at a time when the uterus is excessively bulky and the ligaments that should support it are relaxed, favors prolapse of the organ, and so induces passive hyperæmia, which thus interfere with involution. This will of course be aggravated by prolonged standing or severe muscular efforts. It is not a good plan, however, to keep the patient reclining on the back for too long a period and to apply a pad and tight binder, as the uterus becomes thus retroverted or retroflexed, and therefore necessarily congested. The presence of any cardiac mischief, a fibroid of the uterus, or the pressure of any abdominal tumor, will also tend to keep up passive hyperæmia and so favor subinvolution.

Abortion has a still greater influence in the production of subinvolution than even parturition at full term. This is readily explained by the fact that the dehiscence of the decidua at an early stage of pregnancy is often imperfect, owing to the close attachment to the uterine mucous membrane, the unpreparedness of the uterus to throw off the ovum, and the frequent occurrence of some morbid process which determines the abortion. The stimulus of lactation is absent, the patient generally gets about again too soon, and not only favors congestion of the uterus by connubial intercourse, but incurs the risk of another pregnancy before the process of involution has had time to take place.

Abortions being apt to occur in patients who are the subjects of some cachexia or constitutional weakness, the process of absorption is also interfered with.

Thomas considers that "the woman who has never been pregnant is much less liable to areolar hyperplasia than she whose uterus has undergone the tissue-changes of utero-gestation; nulliparity securing, to a very great extent, an immunity from the disease, and multiparity constituting a most important predisposing cause. Still, the uterus may become considerably enlarged independently of pregnancy, as in cases of stenosis, or flexion of the uterus, the muscular tissue becoming hypertrophied from the violent efforts made to expel the contents. Moreover, it must be remembered that the uterus is constantly undergoing changes from puberty until the menopause, its vascularity and functional activity being increased by emotional influences as well as by the ever-recurring menstrual congestion. Any alteration in these conditions may give rise to hypertrophy or hyperplasia. And here it may be well to note that hypertrophy signifies excessive growth of the elements of a tissue already existing; hyperplasia signifies the development of new tissue."

Varieties.—Hyperplasia may be limited to either body or cervix, or may affect both conjointly, but of all forms of the affection, the cervical variety is the most frequent. This is explained by the fact of the cervix being particularly exposed to mechanical injury

during parturition, by its liability to laceration at this time, and by the greater risk of injury from friction, coition, cold, etc.

When involution is retarded, but at length is accomplished, it sometimes takes place in the body but fails to do so in the neck, from the exposure to injurious influences.

Cervical endometritis, which in multiparous women proves a not infrequent source of the disorder, is more common than the kindred affection of the body.

Symptoms.—Those of subinvolution are chiefly a feeling of weight, discomfort, or bearing down or dragging in the pelvis. As laceration or granular degeneration of the cervix frequently complicates subinvolution, we have in addition the presence of leucorrhœa, hæmorrhage on coitu, the recurrence of menstruation even during lactation, irritability of the bladder, pain in the back and loins, and other evidence of local discomfort. The general health suffers, the appetite is capricious or defective, nausea is not infrequent, the bowels are confined, the digestion disordered, and the spirits often very depressed. Owing to the increased weight of the uterus, and the softness of its tissue at this stage, displacement is pretty sure to occur; partial prolapse, retro-version, or -flexion taking place, when fresh symptoms arise and call for attention. There is difficulty in getting about, a sense of pressure on the bladder or rectum, nausea on first putting the feet to the ground in the morning, inability to stand for long, or even to sit upright, the patient feeling as if her back would break. Besides the leucorrhœa, there is often a continuous sanguineo-purulent discharge, which weakens the patient still more.

When the subinvolution has passed into the stage of areolar hyperplasia the symptoms may be less acute, but nevertheless well marked, being naturally more prominent in those cases where the body of the uterus is mainly affected. There is a constant sense of a dull, heavy, dragging pain through the pelvis, increased on standing or walking, pressure on the rectum and bladder, often accompanied by tenesmus, pain on defæcation and coition, dull, heavy pain before and during menstruation, pain in the mammae being not infrequent at these times, the flow being generally excessive, except in the advanced stage, when, owing to the degeneration of the endometrium, the amount is considerably lessened.

Owing to the patient being unable to take a proper amount of exercise the bowels often become very confined, the appetite diminished, dyspepsia with headache, languor, sleeplessness, and other distressing nervous symptoms arise, and the patient becomes a confirmed invalid. She not infrequently imagines that she is pregnant, the nausea, bearing down, pain in the breasts, darkening of the areolæ, etc., seeming to support this hypothesis.

Physical Signs.—Where the cervix is chiefly involved, it will be found to be large, swollen, and painful, the os patulous. On conjoined manipulation the cervix is found to be unduly sensitive, more especially if it be lifted up by the finger. There is usually some amount of laceration or granular degeneration present.

In the early stage of subinvolution there is a softness of the tissues, which is less noticeable in the more advanced forms of hyperplasia.

In corporeal hyperplasia, on conjoined manipulation, the body of the uterus is found to be much enlarged, the thickening of the walls being greater than the increase in length of the uterus. The organ is lower in the pelvis, and less mobile than normal from its intrinsic bulk; more sensitive to pressure than in health.

Differentiation.—Subinvolution, when the uterus is very bulky, is often very difficult to distinguish from early pregnancy, more especially if the patient be suckling at the time, and no information can be gained by the absence of the catamenia. The points most likely to assist us in forming an opinion will be that in early pregnancy the uterus is more globular, of a softer consistence, and gives to the sense of touch on conjoined manipulation the feeling of being tense, as if the contents were of a fluid nature. If pressure be carefully but steadily maintained, the consistence of the organ will be found to vary, owing to the rhythmical contractions and relaxations which take place in the pregnant uterus, and less tenderness will be observed than if the case were one of subinvolution. The subjective symptoms, such as nausea, pressure upon the neck of the bladder, irritation of the breasts, etc., are often as well marked in the one condition as in the other, and will not therefore help us much. Even the recurrence about once a month of a sanguineous discharge, simulating menstruation, may be due to a granular condition of the cervix allowing of passive hæmorrhage during the early months of utero-gestation.

Fibroid tumor of the uterus, especially if it be imbedded in the uterine wall or bulge internally, may occasion more or less symmetrical enlargement of the uterus closely simulating areolar hyperplasia. The only method of differentiating the two conditions is to dilate the cervix by means of a laminaria tent, and explore the interior of the uterus with the sound and finger, assisted by the bimanual exploration. In cases of fibroid there is more likely to be a history of menorrhagia being a prominent symptom. The difficulty of diagnosing is often very great.

In the later stage of areolar hyperplasia, when the cervix is chiefly affected, and the tissues have become dense and firm—the so-called sclerosis—it is often difficult to discriminate between this and scirrhus cancer of the cervix. The mistake has unquestionably frequently been made.

In hyperplasia, the history is often one of long standing (following parturition); the condition is not at all infrequent. The cervix is movable, unless fixed by surrounding deposit from previous pelvic inflammation; it feels dense, but at the same time there is a feeling of elasticity about it, and the mucous membrane can be made to glide over the surface. If a sponge-tent be passed, the cervix softens and dilates; the body of the uterus is generally implicated. Menstruation is usually scanty, the pain being worse at these times. There is no cachexia.

In scirrhus of the cervix, the history is seldom of many months' duration; it is comparatively rare. The cervix soon becomes fixed; it is very hard, like cartilage or wet india-rubber, the hardness extending to the very surface. A sponge-tent has no effect in softening or dilating the cervix; the body of the uterus is seldom implicated. Menorrhagia is a common symptom, and is apt to occur at irregular times, the pain being relieved by the hæmorrhage. Cachexia is soon manifested.

Prognosis.—Where the body alone, or the entire uterus, is affected, the probability of curing the disorder is very remote, although much may be done to relieve symptoms and promote the patient's comfort. Where the cervix is alone involved, being a much less sensitive and important part of the organism, and also being much more accessible to local treatment, the prognosis is more favorable, if the patient will only persevere sufficiently long with treatment. Towards the menopause the probabilities of the symptoms becoming less urgent, or even of atrophy of the uterus occurring, should be borne in mind, though there is no certainty of either.

The possibility of hyperplasia of the cervix degenerating into malignant disease is apparently very slight.

Numerous complications may be met with, such as displacements, endometritis, cellulitis, menorrhagia, etc., which will influence the prognosis.

Treatment.—Bearing in mind that arrest of involution of the puerperal uterus is an occurrence of very great frequency, and constitutes the chief cause of all chronic uterine disorders (Thomas), we cannot be too careful in doing everything in our power to promote the normal physiological involution of the uterus following delivery. We may therefore divide our remarks into the prophylactic or preventive, and the curative treatment.

Prophylactic.—The mere fact of allowing a patient to expend her efforts in fruitless attempts to expel her offspring, thereby exhausting the nerve-force and wearing out the muscular energy of the uterus, so that it is with difficulty sufficient contraction of the organ is excited to expel the placenta or prevent subsequent relaxation, may prove sufficient to interfere materially with the process of involution, and thus sow the seed of much future discomfort. Much may be done to obviate uterine disorders by a little timely assistance in the lying-in room. The application of the forceps in a case of tedious labor may prevent the necessity of resorting to subsequent treatment for subinvolution, retroflexion, and other uterine disorders.

Care should be taken to secure efficient contraction of the uterus after the expulsion of the placenta; any clots that may have formed should be removed, the vagina syringed out twice daily with tepid water, containing a little Condyl's fluid or carbolic acid, the patient allowed to sit up for a few moments daily even from the first so as to allow any clots in the vagina to be expelled; the child should be put to the breast at stated intervals for at least the

first month or six weeks, involution proceeding much more rapidly if lactation be performed. The patient should not keep too rigorously to the dorsal position, but be encouraged to turn on her side from time to time. For the first month it is well to avoid standing or walking as far as possible. The general health should be attended to, fresh air and daylight being freely admitted to the room, all soiled linen immediately removed, the bowels regulated, the appetite seen to, and sleep secured. If lactation be not resorted to, a mixture of ergot and cinchona, or nux vomica and quinine should be administered for the first month or six weeks, to promote uterine contraction.

If there be the least suspicion of the placenta not having been completely and entirely expelled, or of any portion of the membranes being retained, or of a clot having formed in the uterus, this should at once be seen to, the uterus being washed out regularly if necessary, so as to avoid the least risk of septic absorption. If the lochia are offensive, it is a prudent plan to wash out the interior of the uterus with some antiseptic solution.

Before concluding his attendance the practitioner should take some opportunity of examining to see whether the cervix be granular or lacerated, the organ misplaced, or any condition present necessitating local treatment.

Curative.—In the event of these preventive measures not having been attended to, and the uterus is found to be considerably larger than normal, some months after abortion or parturition, our first object should be to ascertain, as far as possible, whether any portion of the placenta has been left in utero. If hæmorrhage has been a prominent symptom, and the os uteri remains unduly open, this supposition will generally prove to be correct. If the os be not sufficiently patulous to admit the finger, the cervix should be dilated by laminaria tents. If the patient be very nervous or sensitive, or the vagina unusually small or lengthened, it will be well to produce anæsthesia, as the operation is often a tedious and difficult one.

The bladder having been emptied, the patient's hips brought well to the edge of the bed, the dorsal position, with the knees drawn up, being generally the most convenient one, the left forefinger is passed into the vagina and so into the cervix uteri. The fundus being then depressed by the right hand externally pressing over the lower abdomen, the forefinger is enabled to explore the fundus, and ascertain if any projecting portion be present. If this can be detected it may be scraped off with the finger-nail, or, in some cases, a pair of ovum forceps, having a catch at the handles, may be passed up and the portion of placenta extracted. The finger is by far the better instrument to employ, as a rule, and if the fundus be well depressed the finger will generally prove sufficient; should this not prove to be the case, the ovum forceps, or dull wire curette, may be employed. Ergot should then be administered, and the patient kept perfectly quiet. The vagina should be washed out daily, and should the discharge from the uterus

become in the least offensive, or the temperature become elevated, it will be well to wash out the cavity of the uterus with some anti-septic injection of carbolic acid or iodine. A mixture of bark and acid with ergot will generally prove of service in favoring involution.

Abortions are even a more frequent cause of subinvolution than parturition at full term. Care must be taken that the whole of the ovum be removed, when it is not expelled entire; the cause that produced the abortion should be inquired into and obviated if possible, any retroflexion being remedied by a Hodge's pessary and appropriate position. Strict rest should be enjoined for the first week or ten days, and the patient should not return to the marital couch, nor to her usual occupations, for at least a month. A mixture of ergot and cinchona will favor the process of involution. If the cervix be granular, suitable applications should be resorted to. Where the habit of abortion has been established, it is of great importance to allow time for the uterus to recover perfectly before incurring the risk of further conception.

Thomas lays special stress upon examining for, and removing if discovered, the five following complications which very often accompany areolar hyperplasia, and establish symptoms which greatly increase the evils attending it:

1. Laceration of the cervix uteri, which creates intense nervous irritation, both immediate and reflex, and consequent uterine congestion and neuralgia.
2. Displacement of the uterus, which results in vascular engorgement, dragging upon uterine ligaments, mechanical interference with surrounding parts, and difficulty in locomotion.
3. Fungoid degeneration of the endometrium, which results in profuse leucorrhœal and bloody discharges.
4. Granular and cystic degeneration of the cervix, which produces nervous and vascular derangement of the uterus, leucorrhœa, and menorrhagia.
5. Vaginitis, which is excited by the discharge dependent upon engorgement of the endometrium.

In some cases the benefit derived from an appropriate pessary will be the chief, perhaps the only, relief which we can bestow, and even where we cannot cure the disease, we may render life much more tolerable by the alleviation of discomfort. Relief of displacement favors free venous return, and prevents congestion, which feeds and perpetuates hyperplasia.

General Treatment.—Everything conducive to improvement of the general health, removal of any obvious exciting cause of uterine disorder, and attention to the ordinary requirements of the system, must be carefully attended to. The diet should be simple and nutritious, stimulants taken in strict moderation or entirely forbidden, the action of the skin encouraged by warm baths or sea-bathing, the bowels regulated by suitable aperients, mental depression obviated by cheerful society, change of air, or a stay at the sea-side. If possible, a resort to one of the spas or mineral

watering-places, such as Kreuznach, in Germany, where the water contains bromide of magnesium, should be encouraged. Failing this, a visit to a well-conducted hydropathic establishment, where pure air, plain and nutritious food, and agreeable society can be obtained, often proves of great service.

Ferruginous tonics, combined with saline aperients, will be indicated where anæmia exists. In the early stages ergot, nux vomica, and cinchona given continuously for many weeks or months, exercise a beneficial influence in exciting contraction of the uterine tissue, thus diminishing hyperæmia and so lessening the bulk of the uterus. The bromide of potassium alone, or in combination with ergot, etc., is also useful in these cases.

Rest in the recumbent position, either continuously or for many consecutive hours each day, has generally been resorted to by the patient herself before applying for assistance from the physician.

This will, however, need to be regulated according to the nature of the case. Absolute rest is seldom requisite, the general health becoming much deteriorated where this is enforced. The patient should go out daily for health's sake, driving if she cannot walk, but in any case getting out when the weather permits. An abdominal belt may prove of service in taking off the superincumbent weight of the intestines. Skirt-supporters and other arrangements to prevent the clothing pressing unduly upon the lower abdomen will also assist; the corset being strictly forbidden.

If much sense of bearing down or dragging be experienced, or if the uterus be displaced, a well-adjusted Hodge's pessary will afford marked relief, by insuring rest and preventing congestion.

Physiological rest, coitus being either interdicted or permitted but rarely, should be enjoined.

Depletion.—Where the uterus is not only excessively bulky but also tender, and the periodical menstrual discharge proves inadequate to relieve the congestion of the organ, the abstraction of an ounce or two of blood by means of puncture or scarification will be indicated.

FIG. 100.

Barnes's Vulcanite
Tampon Introducer.

FIG. 101.

Spear-pointed
Scarificator.

Leeches often produce much pain, are at all times troublesome of application, and are not adapted for cases of hyperplasia. Three or four stabs are made with a small spear-pointed scarificator (Fig. 101), or an ordinary three-sided surgical needle, the number of incisions being increased if requisite, and when sufficient blood has been allowed to flow, a glycerin plug is inserted close up to the

cervix, and allowed to remain for the next twelve hours or so, the patient meanwhile retaining the recumbent position. Another plan is to pass a bistoury up as far as the os internum, cutting through the mucous membrane as the blade is withdrawn through the os externum. In advanced cases of hyperplasia depletion is not often successful—either as to the amount of blood extracted or as to the benefit derived.

Glycerin applied to the cervix uteri on plugs of cotton-wool (Fig. 102) to which a string is attached, is a valuable method of depleting the uterus, the watery discharge induced serving to diminish materially the bulk of the uterus. Barnes's Tampon Introducer (Fig. 100) may be employed to enable the patient to introduce them night and morning. Vaginal injections of hot water, morning and evening, by means of the siphon douche, as described later on, is of much service in allaying pain, removing discharges, controlling the pelvic circulation, and promoting absorption. To be of any real service the injection must be continued for at least a quarter of an hour, and repeated regularly and systematically for several consecutive weeks, or months, as the case may be.

Local Applications.—Much may be accomplished in reducing the bulk of the uterus by the persistent employment of various agents to the vaginal portion of the cervix, or, in some cases even, when endometritis exists, to the cervical canal. Of these, iodine in some form generally proves most useful. The liquor iodi (= 1 in 24), or in very chronic cases, the linimentum ioli (= 1 in 9) may be applied by means of a Playfair's probe coated with cotton-wool to the cervical canal, as well as to the whole of the vaginal cervix. A plug of cotton-wool saturated with glycerin is then passed up to the cervix, and allowed to remain *in situ* for twelve hours, when it is withdrawn by the aid of the string, and the hot-water douche applied. This application may be repeated once a week, or oftener—avoiding any risk of setting up irritation just before the menstrual period is due.

Observation has led to the conclusion that hyperplasia associated with erosion of the cervix is more amenable to treatment than when no such complication exists. Following up this hint, various methods have been resorted to for the production of artificial erosion. The application of vesicating collodion—which is a compound of ordinary collodion, acetic acid, and cantharides—to the whole of the vaginal cervix, is a simple method of accomplishing this object. It is effected by the aid of a Fergusson's speculum, sufficient time being allowed for it to dry, when another coating is applied, any excess running down on to the vagina being carefully avoided. Within the course of eight to twelve hours the epithelial covering of the cervix is entirely removed, a fine secretion of serum taking place from the surface as in case of an ordinary blister. The same result may be obtained by rubbing the solid nitrate of silver freely over

FIG. 102.



Tampon or plug of cotton-wool.

the cervix; the epithelial covering soon sloughs off, leaving a granulated surface beneath. Glycerin-plugs should be inserted morning and evening, so as to encourage the flow of serum, and prevent the discharge becoming acrid or offensive.

As soon as the surface heals another application may be made, or the iodine may be painted over the cervix.

Where the cervix is mainly affected, the introduction of laminae or sponge-tents at successive intervals of a few days will soften the tissue and produce a copious, watery discharge, thereby altering the nutrition of the cervix. The application of strong caustics, such as carbolic or nitric acid, or the linimentum iodi, to the cervical canal has often a similar effect in inducing a process analogous to that of involution.

Amputation of one or other lip of the cervix by the galvanic *écraseur*, and the employment of glycerin-plugs until the surface has healed, will reduce materially the bulk of the cervix and alter its nutrition.

Where the methods indicated have been tried and failed there are other means at our disposal, but these should always be reserved for severe and very persistent cases, as their employment is not unattended by risk. The three methods usually resorted to are the application of *potassa fusa*, the actual cautery, and amputation of the cervix. Previously to the employment of either the *potassa fusa* or the cautery, it is well to lessen the congestion as far as possible by puncturing the cervix and using hot-water vaginal injections.

The time chosen for commencing treatment should be shortly after a menstrual period. The patient, being in bed, is placed either in the dorsal or left lateral position, the latter being generally the more convenient. As large a size Fergusson's speculum as the vagina will tolerate is then passed, and the cervix brought well into the end of the speculum and wiped dry. Cotton-wool steeped in vinegar is then packed carefully under the cervix, so as to neutralize at once any excess of the caustic potash that may run down; a little vinegar, injected so as to make a small pond under the cervix, answers the same purpose. A portion of the fused stick of caustic potash being held firmly in a *porte-caustique* is then rubbed slowly and firmly over a surface not larger than a sixpence, on one or both lips of the cervix, avoiding carefully the os uteri on account of subsequent contraction. The mucous membrane is thus completely destroyed. A stream of vinegar and water is then injected, to wash away and neutralize any excess of the potash, any cotton packing removed, and a tampon saturated with glycerin passed up to the cervix. The patient must remain quiet until the slough has separated, this usually occurring in about a week, some antiseptic injection being used morning and evening. The *potassa* is again freely applied to the raw, cuplike depression, the same precautions being observed as before. If the induration be localized, the contractions of the uterine tissue, aided it may be by the exhibition of ergot internally, may serve to extrude the indurated

nodule, the potassa being reapplied until the whole of it is destroyed. The more sensitive the tissues become to the action of the potassa the more clear is the indication that the healthy structures have been reached. The excavation produced heals by granulation, and may take many weeks to fill in, the cervix then presenting a normal appearance, with no cicatrix or evidence of the tissues having been destroyed. The patient should be carefully watched during the healing process, to see that no contraction of the cervical canal or obliteration of the os uteri ensues.

The potassa fusa causes a deeper destruction of tissue than the potassa cum calce, and being more deliquescent is more apt to run down into the vagina, but still it is far more effective, and accomplishes the object in much less time.

Chloride of zinc is also a powerful form of caustic, but produces more pain than the potassa, and is less generally useful.

There is always a certain amount of risk of setting up pelvic cellulitis; strict care should be taken therefore to preclude any risk of catching cold, or of the patient exerting herself imprudently.

The actual cautery is another method of producing an eschar upon the cervix. Paquelin's benzoline cautery is probably the most convenient form we can employ. A platinum button, heated to a dull red or nearly white heat, is pressed momentarily upon one or both lips of the cervix, so as to produce a superficial or deep slough, as may be desired. A wooden, ivory, or horn speculum should be employed, though a large cylindrical metal one may be used if care be taken not to allow it to become overheated. The surface of the cautery being polished, there is less radiation of heat than with the ordinary cautery, and it does not adhere to the tissues. A stream of cold water should then be injected, and a glycerin tampon applied as before directed.

The galvanic cautery may be employed where we wish to produce more extensive sloughing.

Amputation of a portion of the cervix, when the length as well as the breadth is increased, by means of the galvanic *écraseur*, has been recommended with a view to inducing involution. If a small portion of the hypertrophied organ be removed, a marked tendency to diminution in the bulk of the remaining tissues shows itself. One or other lip of the cervix may thus be removed, either by excision with curved scissors and the subsequent application of the actual cautery, or by the galvanic *écraseur*, thus saving much time in treatment. It is generally advisable to administer an anæsthetic, and every precaution should be taken to prevent any exposure to cold or retention of discharges in the vagina.

Thomas considers this method possesses none of the advantages of trachelorrhaphy (the operation for repair of the lacerated cervix), to which it is inferior in every respect.

CHAPTER XIII.

GRANULAR AND CYSTIC DEGENERATION OF THE CERVIX UTERI.

Granular Degeneration of the Cervix Uteri.—This condition almost invariably complicates affections of the uterus where leucorrhœa is a prominent symptom. It may exist independently of other well-marked disease of the uterus and give rise to little or no inconvenience beyond the leucorrhœa. In other cases it induces such a condition of hyperæmia in the uterus, and reflex irritation, as to interfere materially with the patient's comfort and well-being.

It has been described as epithelial abrasion, granular ulcer, or erosion of the cervix, but the term granular degeneration best describes the actual character of the affection.

Pathology.—The smooth mucous membrane covering the cervix, which is continuous with that of the vagina, passes up the cervical canal as far as the internal os uteri. Numerous papillæ may be detected on the surface of this membrane, formed by vascular loops covered with squamous epithelium. Either from the extension of catarrhal endometritis, or from the effect of other sources of irritation, the squamous epithelium proliferates, becomes softened by maceration in the ichorous cervical discharge, and finally desquamates, either gradually or *en masse*, only one layer of cells remaining, giving the surface the appearance of being congested and slightly granular. From this epithelial layer prolongations project inwards so as to form glandular crypts, villous prominences arising by the growth of the vascular connective tissue, these projections being new formations and not hypertrophied papillæ. They are covered with epithelium and richly supplied with superficial blood-vessels. This condition has been termed villous or papillary erosion, varicose and bleeding ulcer, and cockscomb granulation.

The term "ulceration" is still frequently employed to describe this granular degeneration, but although at first we have loss of tissue, there is no progressive ulceration or gradual destruction of tissue such as is met with in true ulceration, and therefore the term is not appropriate,

Causation.—Anything that impairs the general health, more especially if there be a strumous diathesis, predisposes to this affection. The actual exciting causes are anything tending to produce or keep up congestion of the uterus, such as immoderate coitus, displacements, habitual constipation, etc. The extension of gonorrhœa from the vagina, or the mere fact of the cervix being constantly bathed in an ichorous secretion, or the chafing of a vaginal or intra-uterine stem pessary against the cervix, will often be found to set up granular degeneration. It may occur in virgins, giving

rise to so much discharge as in some cases to raise suspicion of disease having been communicated. It is, however, a condition more frequently met with in married women and those who have borne children. In these latter cases there is often some laceration of the cervix complicating the granular degeneration, and we must be careful to distinguish the two conditions, as in extensive laceration of the cervix there is often such an amount of eversion of the mucous membrane as well as destruction of the epithelial covering of the cervix from injury during labor as to lead to error unless care be taken.

Symptoms.—In simple uncomplicated cases there may be no evidence of the presence of the disorder beyond leucorrhœa. In cases, however, associated with cervical endometritis and other inflammatory conditions of the uterus, where the bulk of the organ is increased and displacement results, a new train of symptoms ensues, such as dragging sensations in the pelvis, pain in the back and loins (worse on standing or walking, as also after intercourse), menorrhagia, hæmorrhage on coitus or exertion, profuse sanguineo-purulent leucorrhœa, together with nervous symptoms such as previously mentioned as complicating endometritis.

Granular degeneration is frequently met with coincidently with utero-gestation, and gives rise to many distressing symptoms, such as burning pain in the pelvis, profuse leucorrhœa, intense nausea, hæmorrhage upon any slight exciting cause, and not infrequently abortion results from the excessive irritation.

Diagnosis.—On digital examination the cervix feels soft and velvety or granular, not smooth as in a normal condition. However granular the surface, no hæmorrhage is produced by an ordinary careful examination, whereas in epithelioma uteri in the early stage the least touch is often sufficient to produce considerable hæmorrhage.

On getting the cervix well into view by means of a Fergusson's speculum, the surface is found to be bathed with a thick creamy pus. On mopping this away, the cervix will be seen to be intensely red, florid, granular, the surface being somewhat elevated above the normal level of the surrounding mucous membrane, having a villous appearance.

In severe cases following parturition there is generally some hyperplasia of the cervix together with a more or less nodular or irregular condition due to slight lacerations. Where bilateral laceration of the cervix occurs and ectropion of the cervical mucous membrane is produced, this will be more evident to the touch than to the sight.

In epithelioma of the cervix it feels more indurated, the os is more clearly defined, often hard and irregular, hæmorrhage is very readily induced, and on looking at it through the speculum it appears less angry, more ulcerated than in cases of granular degeneration.

Prognosis.—The disease may go on for an unlimited time if not properly treated, becoming worse as the congestion and reflex irrita-

tion increases. Where, however, appropriate measures are adopted to improve the general health, alter the character of the surface affected, and remove any existing complications, a cure may safely be predicted. In long-standing cases treatment will need to be persevered with steadily for some time.

Treatment.—This will differ materially, depending upon the severity, duration, complications, and state of health. In simple cases the mere employment of the syringe, with suitable injections of borax, alum, zinc, chloral, acetate of lead, etc., will often prove sufficient to relieve the condition, provided the general health be also attended to and all obvious causes conducing to keep up the irritation be removed.

Where the disease is of long standing it will generally be found to be secondary to some other antecedent condition, such as vaginitis, endometritis, displacement, etc. It is essential for success that any primary disease should be discovered and dealt with simultaneously. If vaginitis be present this must be properly treated, otherwise we shall in vain attempt to cure the granular degeneration so long as the exciting cause of its production remains. If endometritis exist, suitable means must be adopted to remove it, as described when speaking of this condition.

If the cervix be lacerated to any extent, it will be necessary to repair this by an operation. The eversion of the mucous membrane consequent upon laceration is often mistaken for granular degeneration. Unless this be detected and repaired, all our applications will be of no avail.

If any displacement, such as retroversion, retroflexion, or prolapse be detected, a Hodge or other vaginal pessary should be fitted so as to relieve the tendency to congestion and remove the cervix from all influence of friction.

The action of the pessary may be still further assisted by means of abdominal and skirt supporters, which take off the pressure upon the lower abdomen of tightly fitting or heavy clothing.

Rest in the horizontal position during menstruation, regulation of the bowels, avoidance of prolonged or undue exertion, or of too frequent intercourse if the patient be married, should all be insisted upon.

The general health must also be attended to, suitable tonics being prescribed and the diet properly regulated. This is fully discussed in speaking of endometritis.

Having attended to these preliminary points, we have now to consider the various methods of influencing the local condition of the cervix by means of vaginal injections, tampons, pessaries, applications of caustics, etc.

The employment of water, at a suitable temperature, to remove all secretions from the vagina, and thus favor a more healthy condition of the cervix, is absolutely essential for successful treatment.

This may be effected by means of an irrigator, siphon douche, syringe, or bath.

The irrigator consists of a suitable vessel, near the bottom of

which is inserted a flexible tube, provided with a stopcock, so as to control the delivery of the fluid. To the end of the tube a vaginal nozzle is attached.

The vessel having been filled with water is placed at a convenient height above the patient, either suspended from a nail or standing on the top of a chest of drawers. The stopcock being turned, the fluid is allowed to flow into the vagina in a continuous stream.

The siphon douche is arranged by filling a jug or can with water at the desired temperature. A long india-rubber tube, stiffened by means of gutta-percha at the bend, so as to prevent it collapsing, provided with a hollow leaden ball at one end and a vaginal delivery-tube at the other, is then immersed in the fluid, the stopcock being turned so as to allow the fluid to enter. Before removing the vaginal end of the tube from the jug, the stopcock is again turned so as to prevent the water running out. On now opening the stopcock a continuous stream of water can be made to flow into the vagina until the vessel be emptied, or the leaded end of the tube being placed in the vessel and the stopcock opened, the fluid may be made to enter by simply drawing the thumb and forefinger along the tubing from the rim of the vessel downwards.

The great advantage of employing the irrigator or siphon douche is that the patient can administer it herself whilst lying in the dorsal position. The hips being placed over a bed-bath, or bed-pan, to which a flexible tube is attached to carry the fluid away into a foot-pan or other vessel on the floor, the vaginal tube is inserted a short distance into the passage, the stopcock turned and the water allowed to flow.

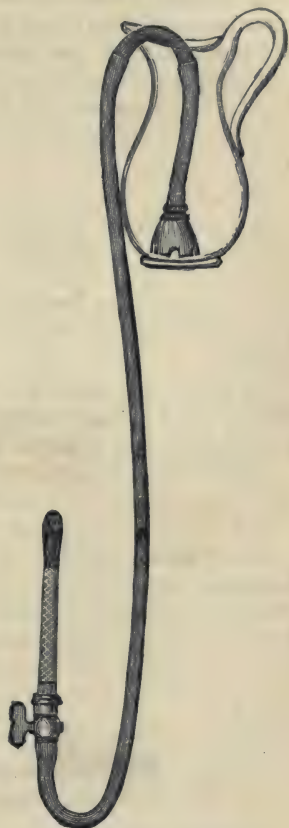
Another method is to lie with the buttocks projecting over the edge of a low bed or couch, the feet resting on two chairs, and a mackintosh arranged so as to conduct the water into a vessel below.

Syringes of various kinds are employed. Those made of india-rubber are the most suitable; pewter or glass should never be used, the latter being very liable to break and so cause accidents.

Higginson's syringe is one of the most convenient forms. Kennedy's is also a very useful one.

The vaginal tube should be adjusted so as to lessen the force

FIG. 103.



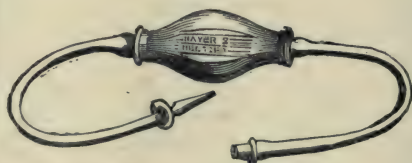
Siphon Uterine Douche.

with which the fluid is injected, and prevent the possibility of the bone nozzle being inserted into the cervix.

Instances of severe uterine colic, intense agony, peritonitis, and even death from the employment of vaginal injections have been recorded. In some cases this may possibly be explained by the tube being inserted into the patulous cervix of a retroverted uterus. We cannot therefore be too careful in explaining to the patient how to use the syringe properly.

In employing the syringe the patient may sit over a bidet, or ordinary chamber-utensil, the water being placed in a basin standing on a chair or on the floor by her side, as most convenient to her.

FIG. 104.



Higginson's Syringe.

In some instances the syringe may be used whilst the patient is sitting in her hip-bath, or the bath-speculum may be inserted in the vagina so as to allow the water to gain ready access to the cervix.

For ordinary purposes of ablution the syringe answers perfectly well, but where we need the stimulating, sedative, or alterative effect of long-continued applications of cold or hot water, the irrigator, siphon douche, or employment of the syringe by a nurse, becomes requisite.

After the employment of cold, tepid, or hot water to remove any secretions from the vagina and promote a healthier action of

FIG. 105.



Syringe for Injecting Lotion.

the mucous membrane, the best way of applying any medicated solution is for the patient to recline on her back, with the hips slightly elevated, so as to allow the retention of the fluid in the vaginal cul-de-sac. A small syringe holding two to four ounces having previously been filled with the lotion is then used to inject it into the vagina, the patient retaining it for some five or ten minutes, when, on sitting up, the fluid runs out into any suitable receptacle. This is a far more efficacious method of applying injections than using them very dilute merely to wash the surface momentarily.

As emollient injections the following will be found very useful,

especially if the vaginal secretion be much increased, and by its acidity tends to keep up the granular erosion of the cervix: Either sodæ biboratis 5j-ij; glycer. boracis 5ss-j; sodæ bicarbonatis 5ij-iv; potassæ bicarbonat. 5ij-iv; potassæ chloratis 5ij-iv; or liquor. plumbi subacet. 5ij-iv; dissolved in 5vij of water.

Equal parts of the lotion and hot water may be used, the strength being modified at discretion by the addition of more or less water.

The best sedative injections are—hot water, temperature 85–100° F., continuously applied; tinct. opii 5j-iv; tinct. hyoseyami 5ij-iv; tinct. belladonnæ 5j-ij; tinct. iodi 5j-ij; chloral. hydrat. 5j-ij; glycer. purific. 5j-ij; added to 5vij of water.

The lotion being warmed, or diluted with an equal quantity of hot water, increases the soothing effect.

The most useful astringent injections are—either alum 5j-iv; sulphate of zinc 5ss-ij; tannin 5ss-ij; plumbi acetatis 5j-ij; liq. plumbi subacet. 5ij-iv; iron alum 5j-ij; sulphate of copper 5j-ij; or tinct. ferri perchlor. 5ij-iv; dissolved in 5vij of water.

The addition of an ounce or two of glycerin to the mixture, and aqua rosæ in place of plain water, makes a more soothing and at the same time a more elegant lotion. The alum and zinc lotions are the most generally useful; if the others be employed care must be taken to prevent the linen being soiled, as otherwise a stain will be produced. The old form of lotio quercûs has this objection, the tannin answers equally well. They should be employed cold, unless otherwise desired. Ice-cold water may be useful in some cases.

The principal disinfectant injections are—either acid. carbolic. 5iss-5iij; liquor. chlorig. 5ij-5iv; potassæ permanganat. gr. xx-xxx; sodæ biborat. 5ij-5iij; liq. sodæ chloratæ 5ij-5iv; or liq. carbonis detergens 5iv-5j; dissolved in 5vij of water.

The addition of glycerin and rose-water in place of plain water adds materially to the efficacy of the lotion as a disinfectant.

Astringents may also be applied to the cervix by means of tampons soaked in glycerin, in which borax, tannin, acetate of lead, carbolic acid, etc., are dissolved. It is well to first saturate the plug with pure glycerin, squeezing it slightly, so as to get rid of any excess, then dip the face of it in the medicated glycerin, and insert it in the vagina, close up to the cervix uteri. This may be done by the aid of a speculum, or by the patient herself, either through Barnes's tampon introducer, employed for this purpose, or by merely passing the plug up the vagina as far as the finger will reach. Glycerin is an excellent solvent for the drugs mentioned, thirty to sixty grains to the ounce, one-half the strength of the pharmacopœial preparations, being sufficient. The glycerin itself acts most beneficially in depleting the cervix by producing a copious watery discharge.

Another method of applying agents to the cervix is by means of suppositories or pessaries. These may be made either with cocoa butter; one part of powdered gelatin moistened with three parts of glycerin gently heated and poured into moulds; or one part of

pure paraffin to four of vaseline. As astringents, alum gr. x-xv; iron alum gr. x-xv; alum and catechu gr. x-xv of each; tannin gr. iij-v; acetate of lead gr. iv-vj; matico gr. x; persulphate of iron gr. iv-vj, incorporated in a small conical pessary, may be employed.

As sedatives, morphia gr. ss, with atropine gr. $\frac{1}{20}$; chloral. hydrat. gr. v-x; extract. opii gr. j-ij; morphia gr. $\frac{1}{3}$; extract. belladonnæ gr. j; extract. conii gr. v-x; may be employed either alone or in conjunction with an astringent.

FIG. 106.



Sponge-holder.

Zinci oxidi gr. x-xv; bismuthi oxidi gr. x-xv; borax x-xv; unguent. hydrarg. gr. x-xx; plumbi acetat. gr. v-vj; iodoform gr. ss-ij, also form useful applications in cases of granular erosion.

A single pessary is inserted into the vagina by the patient herself on retiring to rest, and allowed to dissolve *in situ*, the syringe being employed on rising in the morning to wash away the *débris*. It is essential that the patient remain lying down during their employment.

Local applications to the cervix will generally need to be employed about once a week by the physician himself.

In virgins the use of vaginal injections may first be tried, a suppository being also passed at bedtime if requisite; but where after a fair trial relief does not ensue, it will be necessary to pass the speculum and apply more powerful agents. Any secretion should first be carefully wiped away by means of a little cotton-wool inserted in an appropriate holder, as in Fig. 106. A Playfair's probe, with cotton-wool wound thickly round the extremity, answers every purpose when using liquid applications. A custom still prevalent on the Continent is to pass a Fergusson's speculum, get the cervix well in view, and then pour into the speculum half an ounce or more of a strong solution of nitrate of silver, etc., allowing this to bathe the cervix for a minute or so, and then, by tilting the speculum, allow the fluid to flow out again. In cases of vaginitis this method has its advantages, but where the os uteri is merely involved, it is rather a wasteful and unnecessary method. The ordinary probe, Fig. 95, answers every purpose, and enables us to limit the application to the surface desired.

The agents generally employed are:

Solid nitrate of silver.

Solution of nitrate of silver \mathfrak{z} ij-iv ad \mathfrak{z} j aquam.

Carbolic acid, saturated solution.

Carbolic acid and linimentum iodi, equal parts.

Chromic acid \mathfrak{z} ij-iv ad \mathfrak{z} j aquam.

Nitric acid.

Liquor ferri perchlorid. fortr.

Potassa fusa, or potassa fusa c. calce.

Richardson's styptic colloid.

In severe and protracted cases the application of the actual,

thermo-, gas, or galvano-cautery may become necessary, or we may have to resort to scarification or snipping off the exuberant granulations. If laceration of the cervix exist, an operation for the removal of this may be requisite.

The solid stick of nitrate of silver is still largely employed, and in some cases proves very serviceable. It is rather apt to cause hæmorrhage.

The solution of nitrate of silver may be used where a liquid application is preferred.

Carbolic acid is an extremely useful agent, and suits most cases. It produces a somewhat anæsthetic influence, and so does not prove as painful as some of the other applications.

This acid, combined with the linimentum iodi, exerts a more alterative effect upon the cervix, and is useful in chronic cases where hyperplasia exists.

If chronic acid be employed, great care is necessary to prevent any excess running down on to the vagina. In some cases it is apt to be followed by vomiting and diarrhœa. A saturated solution of carbonate of soda should be used to neutralize any excess.

Nitric acid should be reserved for severe cases, where other remedies have been tried and failed. A single application to the os, and as far up the cervical canal as the granular disease extends, will often prove more serviceable than several applications of less powerful agents. Carbonate of soda will neutralize any excess, but great care should be taken to press out any excess of the acid against the neck of the bottle before employing it.

The first application should be made shortly after a period, and then not again for a month, except in severe cases, when a second may be resorted to within a week or ten days of the first. Carbolic acid or iodine may be applied once a week during the interval.

Liquor ferri perchlor. fort. is very useful where the granulations are very vascular and bleed readily.

Potassa fusa and potassa cum calce are seldom called for in mere granular erosion of the cervix. Where hyperplasia complicates this latter condition, it may be necessary to resort to such powerful agents. The precautions requisite are fully given elsewhere.

Richardson's styptic colloid, which consists of a strong solution of tannin in gun-cotton collodion, answers admirably in some cases. Thomas speaks very highly of it, and says he knows of no means better calculated than this to accomplish the four indications, of first putting the granular surface beyond the influence of friction; second, protecting the surface from contact with ichorous discharges; third, exerting a steady alterative influence upon the diseased surface; and fourth, preventing congestion of the cervix. It appears to act not only as a direct alterative, but by forming a protective crust over the surface, constitutes for it a shield against friction and uterine discharges, while at the same time by its compression of the excoriated villi, permeated by their loops of vessels, and of the submucous tissue, with its increased vascular supply, it diminishes local congestion.

In cases where the cervix is enlarged, infiltrated, and either softened or indurated, and where ordinary applications fail to relieve the granular erosion, the cautery in one or other of the forms enumerated will often furnish good results. A wooden or ivory speculum should be employed to prevent the vagina being injured, and a stream of cold water should be injected the moment the application is completed.

It is not a painful operation in most cases, though naturally somewhat dreaded by the patient. It may be prudent, therefore, to give a few whiffs of chloroform preparatory to operating. If the actual cautery be used, the iron should be nearly at a white heat, in order to prevent the adherence of the tissues which takes place when it is at a dull red. The eschar produced is detached after eight or ten days, leaving a healthy granulating surface, and is not followed by a contracting cicatrix.

Where the uterus is very congested and the granular erosion very persistent, scarification of the surface by means of linear incision is often very beneficial. A sharp-pointed, curved bistoury is passed within the cervical canal as high up as deemed necessary, and as it is withdrawn the mucous membrane is cut through, extending the incision towards the outer margin of the vaginal portion of the cervix as far as requisite. This process is then repeated until five or six similar incisions have been made and the network of vessels thus severed.

Puncturing the cervix with a lancet-shaped scarifier in several places has often a similar beneficial influence, and in intractable cases should always be tried.

Where the granulations on the cervix are very exuberant, so-called cock's-comb granulations, they may be removed by long-handled, curved scissors, or even by the curette, as close as possible to the mucous membrane, and then either the thermo- or other cautery or nitric acid applied to restrain hæmorrhage and check further growth.

Cystic or Follicular Degeneration of the Cervix.—This is a less common affection than granular degeneration of the cervix, but is not an infrequent complication of chronic endometritis. It has been described by some authors as acne, herpes, and aphthæ of the cervix. Any inflammatory condition of the cervix may give rise to these glandular enlargements.

Pathology.—The small mucous glands studding the vaginal face of the cervix as well as the cervical canal not infrequently become closed from the margins of the orifices becoming adherent. The glands then dilate, owing to the retention of the secretion becoming distended into small sacs or cysts, termed ovula Nabothi. On the denser vaginal portion of the mucous membrane of the cervix they merely form small protuberances or eminences, readily felt by the examining finger. Just within the cervical canal, however, they push up the mucous membrane and appear as small cystic polypi.

It is probable that in some cases these small cysts are due to

irritation of the rete Malpighii, and not to closure of pre-existing glands, appearing as small collections of nuclei, which, becoming transformed into cells, project upon the surface, when they are either thrown off or form small cystic polypi containing a gelatinous mucus, mixed with cells and nuclei, fat-globules, spindle-shaped and many-branched cells, and colloid granules. In some cases the distended follicle bursts, discharging its contents, a slight depression remaining constituting the condition known as follicular erosion. In other instances the papillæ become hypertrophied and project beyond the surface as small, reddish, hæmorrhagic-looking tubercles.

Fig. 107.

In patients who have passed the climacteric age these distended follicles may give rise to occlusion of the os uteri, and so prevent the exit of any secretions from the interior of the uterus. The retained mucus gradually distends the organ, especially if there be any chronic catarrhal condition of the mucous membrane of the body of the uterus, producing the condition known as hydrometra.

The accumulation may go on indefinitely until even retrograde dilatation of the Fallopian tubes takes place or some ulcerative process produces perforation and peritonitis. Where the os internum remains narrow we may have the hour-glass form of uterus produced—the uterus bicameratus.

The fluid collection may vary in consistence and character, from a thin, muco-purulent secretion of a yellowish or reddish-brown color to that of a chocolate-colored glutinous fatty fluid containing cholesterin or pus.

Diagnosis.—The sense of touch is generally sufficient to detect the existence of follicular degeneration. This may be confirmed by examination with the speculum. In elderly patients their presence may lead to the suspicion of malignant disease; the small protuberances give to the cervix an irregular, nodular appearance, and where the mucous membrane is much congested the possibility of cancer may readily occur. The cervix, however, is seldom so hard or enlarged as in this latter condition, and the mucous membrane is not fixed to the subjacent surface, nor does bleeding easily occur on examination.

Treatment.—We may first attempt to obliterate the small cysts by puncturing them with a scarifier or bistoury and applying nitric or chromic acid to the interior. If this fail, the potassa fusa or potassa cum calce may be tried, or the actual cautery employed. The diseased glands may be scraped away by the aid of the sharp steel curette, and should the case still prove intractable, our only remaining resort will be to remove the vaginal portion of the cervix by the galvano-cautery wire, the bistoury or scissors.

Where follicular erosion exists, the application of strong carbolic or nitric acid, or the nitrate of silver, may be tried. Care must be

Sims's
Curette.

taken not to produce occlusion of the os uteri by contraction from employing too strong caustics just within the os uteri.

Syphilitic Ulceration of the Cervix.—This is exceedingly rare. When a true chancre does occur in the cervix it presents the usual characteristic appearances of a well-defined, indurated margin, depressed surface, and a marked tendency to become covered by false membrane. The constitutional symptoms become rapidly developed. If any doubt as to the character of the sore exists, inoculation may be practised. In cases of soft sores on the cervix, the diagnosis is simplified by the occurrence of other sores simultaneously on the external organs of generation. Mucous tubercles and other secondary affections are also rarely met with in the cervix uteri.

Tertiary syphilitic ulceration occasionally manifests itself. It is excavated and bleeds readily on touch, not infrequently being mistaken for cancer. There is, however, generally less pain and less fœtor of the discharge than met with in cancer, and the other constitutional symptoms will assist in the diagnosis. Syphilitic ulceration has been known to extend rapidly, penetrating into the rectum and bladder.

Treatment.—In case of chancre it is well to destroy the surface with the strong nitric acid or acid nitrate of mercury, and to resort to the usual constitutional remedies. Black wash may be kept applied by means of a tampon, which will also prevent the vagina coming in contact with the sore.

In case of secondary affections, the biniodide of mercury with the local application of black or yellow wash will be indicated.

Tertiary ulceration must be treated on general principles.

A very guarded opinion should be given as to the nature of the affection unless the evidence of constitutional infection is marked.

CHAPTER XIV.

HYPERTROPHIC ELONGATION AND LACERATION OF THE CERVIX UTERI.

Hypertrophic Elongation of the Cervix Uteri is intimately related to and frequently associated with prolapsus uteri, although the former may occur as a distinct affection. It may be found in nulliparæ, though it is frequently not until marriage that inconvenience is experienced and relief sought.

The body of the uterus occupies its normal position, but the elongated cervix projects into, and occasionally fills to a great extent, the whole length of the vagina, the os externum projecting at the vaginal outlet, or even beyond. The cervix is usually conical in shape, the base being uppermost; the vagina is often shorter than normal, and the os uteri very small. The uterine sound shows the cervix to be elongated, often to as much as two inches or more.

The chief symptoms are such as would be experienced by the presence of a foreign body—such as a polypus—in the vagina. Vaginal irritation with leucorrhœa and occasionally erosion of the mucous membrane of the vagina occurs. Dysmenorrhœa and menorrhagia are not infrequent. In some cases the hypertrophied cervix induces expulsive efforts, which tend to increase the condition. In married patients dyspareunia is almost invariably present; the impact of the male organ increases the tendency to congestion of the cervix, and often sets up inflammation, or even abrasion and ulceration.

In these cases removal of the hypertrophied cervix is the only plan of treatment. This will shortly be described.

After childbirth hypertrophic elongation of the cervix may arise in consequence of the process of involution not taking place properly. Hyperæmia or even subacute inflammation occurs, with serous exudation. Hyperplasia, or proliferation of connective tissue, slowly ensues. The glands of the cervix become hypertrophied, their secretion increased, giving rise to muco-purulent leucorrhœa; eversion of the mucous membrane of the cervical canal, with endometritis and metrorrhagia as a consequence, often results. Dysmenorrhœa and dyspareunia are often complained of.

The gradual increasing hypertrophy of the uterus, the relaxation of the vagina and uterine ligaments, in time cause prolapsus or retroversion.

The cervical mucous membrane, being extremely vascular, is the primary seat of injury during labor, and of congestion and inflammation; it becomes swollen, with gorged vessels, and serum and fibrin poured out into its submucous layers; hence there is

increased villous growth, which can only find room by bulging out through the os tincae (Barnes). Thus a process of gradual continuous eversion and growth of the cervix takes place, hyperplasia being most active at the inner and lower part of the cervix, which becomes elongated.

As this latter descends to the vulva it excites reflex action, the straining increasing the congestion and protrusion. Dr. Barnes calls attention to the fact that when the condition has reached its extreme limit, the cervix and uterus most frequently measure exactly five inches; that is, just double the normal length.

Other causes of hypertrophic elongation of the cervix are stretching of the uterus when adherent to an extra-uterine cyst; involution of the uterus when fixed by adhesions due to perimetritis; the presence of fibroid tumors dragging up the uterus as they grow above the pelvic brim; prolapse of the anterior wall of the vagina, with the base of the bladder producing tension upon the uterus below the insertion of the ligaments which ordinarily keep the organ in its place.

Treatment.—Emmet denies that under any circumstances amputation would be justifiable, or ought ever to be employed for the relief of this condition.

Still, as elongation of the vaginal portion of the cervix unquestionably exists in many cases as a primary affection, and may give rise to prolapse of the uterus, removal of a portion, if not the whole, of the cervix is recommended by most authors. It is, however, an operation not to be lightly undertaken, as serious risks and dangers are liable to be incurred. Primary hæmorrhage is often severe and difficult to check: secondary hæmorrhage may occur. There is great risk of opening the peritoneal cavity behind from Douglas's pouch being carried downwards to a lower level than normal; peritonitis may thus be set up and prove fatal, though it is not invariably so, as cases have been reported where the accident occurred without any well-marked symptoms being developed. The bladder may also be injured anteriorly, and cellulitis be set up in consequence.

Tetanus has been known to occur.

The risks from the operation are materially lessened by the employment of the galvano-cautery, very little constitutional disturbance resulting if due precautions be observed.

There are various modes of performing amputation of the cervix. That by means of the bistoury, or scissors, is the one most frequently resorted to by the majority of modern operators.

The patient being anæsthetized and placed in the lithotomy, or semi-prone position, on the left side, a Sims's speculum is introduced, or the cervix pulled down as far as is prudent, outside the vulva if possible, by means of vulsellum forceps. A sound well curved is passed into the bladder to determine the point to which the bladder descends, a hare-lip pin is then passed right through the cervix about a quarter of an inch below this point, and another at right angles to this. An elastic band tied tightly above this

will serve to restrain hæmorrhage. The cervix may be slit bilaterally, and the two halves severed transversely, by means of scissors, just below the level of the pins, or the whole thickness may be cut through at once with the scissors. In place of leaving this surface to granulate and cicatrize over as formerly advocated, the better plan is to pass silver sutures, as in Fig. 108, so as to draw the mucous membrane over the face of the stump. Before tightening the sutures the elastic band must be removed and the hare-lip pins withdrawn. By this method it will be seen the mucous membrane of the cervical canal is united to that covering the outer circumference of the cervix, and thus occlusion of the os uteri by subsequent cicatrization prevented.

The sutures passing through the tissue of the cervix, there is less likely to be secondary hæmorrhage than where the mucous membrane is merely drawn over the face of the stump, as originally suggested by Marion Sims.

Primary union results as a rule, and the cervix remaining more closely resembles the normal character.

Amputation by means of the chain or wire-écraseur, although apparently very simple, is attended by considerable risk of injury to the peritoneum or bladder, owing to the traction produced during the tightening of the chain or wire dragging in the tissues above the level of its application.

To obviate this, the cervix having being pulled down and the sound passed into the bladder as previously indicated, a hare-lip pin may be passed through the cervix just below the point where the sound reaches.

This will effectually prevent the in-dragging of any tissue not intended to be involved.

Another plan is to sweep a bistoury round the cervix, dividing the mucous membrane at the level where the wire is intended to be applied, so as to isolate completely the cervix from the vagina.

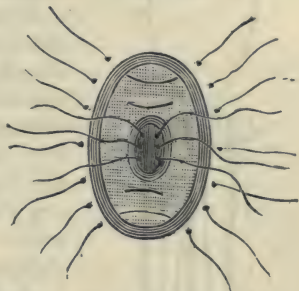
It is not necessary to remove the whole of the vaginal portion; a certain amount of retraction always occurs during the process of cicatrization.

Chassaignac's or Braxton Hicks's wire-rope écraseur is to be preferred. Several strands of fine steel wire twisted in the form of a rope should be employed. One end of this is attached to the crossbar, so as to produce a saw-like action when tightened.

The galvanic écraseur or cautery wire is by far the most expeditious and easy method of amputating the cervix, when the instrument is at hand.

Care must be taken, as in the other modes of operating, to as-

FIG. 108.

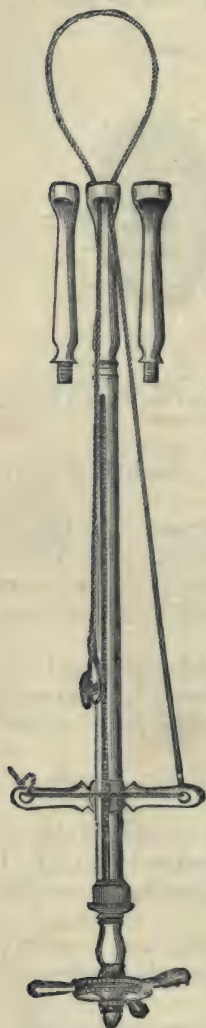


Mode of Placing Sutures after
Amputation of the Vaginal Cervix.
(After SCHROEDER.)

certain exactly the point where the bladder extends to, so that it may not be included.

The operation may be performed with the uterus *in situ*, or the cervix may be drawn down by means of vulsellum forceps. The battery being ready, the wire loop is carefully adjusted around the cervix and tightened sufficiently to become slightly indented in the tissues.

FIG. 109.

Chassaignac's Wire-rope
Ecraseur.

The galvanic current being completed, the wire is gradually screwed up, being tightened slowly to avoid subsequent hæmorrhage, until the cervix is removed. Hæmorrhage seldom occurs if the removal be not effected too rapidly; should any small artery be found jetting, the bleeding may at once be arrested by touching the open mouth of the vessel with the porcelain cone, brought to a dull-red heat by the galvanic current.

A sound may be passed just within the canal after the operation to see that the orifice is not occluded, and a pledget or plug of carbolized oil applied to the stump. To prevent contraction of the cervical canal it will be necessary to pass a bougie or large sound at frequent intervals for several weeks following the operation, or an intra-uterine stem may be worn for a month or two.

The operation is not a very painful one, but it is advisable as a rule to produce anæsthesia so as to secure perfect quiet. It may be performed in the lithotomy or semi-prone position, a Sims's speculum being employed or not, as deemed advisable. The patient will need to remain in bed for a week or two following the operation until the processes of granulation and cicatrization have taken place. Some carbolized vaginal injection may be used twice daily, or oftener if requisite.

Attention must be given to the case for many weeks subsequently, to see that no undue contraction of the cervical canal ensues.

The advantages of operating by this method are the simplicity of its performance, the immunity from hæmorrhage, and the absence of risk of septic absorption.

Laceration of the Cervix Uteri.—This condition is a not infrequent result of parturition, the cervix being torn through, either partially or entirely, on one or other side, or bilaterally, or in a stellate form. Although Simpson called attention to the occurrence of laceration of the cervix some thirty years ago, it is only

within the last few years that prominent attention has been directed to the importance of laceration as a cause of uterine disorder, Emmet going so far as to say that, "at least one-half of the ailments among those who have borne children are to be attributed to lacerations of the cervix." It has not hitherto received the attention in this country that its importance demands, the subject being scarcely mentioned in the leading works on gynecology. When the laceration is very slight it is often spoken of as a fissure, but when severe, and the cervical mucous membrane becomes everted, we have the condition termed ectropion.

Pathology.—The mucous membrane lining the cervix being reticulated, and containing an immense number of Nabothian glands, when laceration of the cervix occurs, and eversion of this membrane results, owing to the exposure and irritation from friction, cystic hyperplasia ensues, with marked leucorrhœa, granular degeneration, and the process of involution is materially interfered with, so that subinvolution of the cervix or the whole uterus remains. Should the tear extend to the vaginal junction, or beyond, the tendency for the tissue to roll out from within the cervical canal is marked as soon as the patient begins to get about, more especially if the laceration be bilateral, dividing the cervix into an anterior and a posterior lip. The angle of laceration soon becomes the seat or starting-point of an erosion which gradually extends over the everted surfaces. A source of irritation is thus established which arrests the involution of the organ. With the increased size and additional weight of the uterus induced by congestion, the tissues gradually roll out as far as the neighborhood of the internal os (Emmet). As rupture of the perineum frequently co-exists, prolapse of the uterus, with retroversion and subinvolution of the vagina, are very apt to take place.

The everted mucous follicles gradually undergo cystic degeneration; they become distended, rupture, and gradually empty themselves, by which the follicles are destroyed, and their cavities disappear by contraction. Epithelioma may spring into existence from the seat of the old injury, as a product of perverted nutrition. Cellulitis being a common result of this accident, and generally situated between the folds of the broad ligament on the side of the laceration, the effect of this is to shorten the ligament, tilting the uterus somewhat, and fixing it towards the injured side.

Causation.—Simpson regarded laceration of the cervix uteri, not as only of frequent occurrence, but so common after first labors as to be regarded as a reliable sign of labor having occurred, and not the result of mismanagement. The most frequent causes of laceration are precipitate labors, where the membranes have been either spontaneously or artificially ruptured, where ergot has been given early in labor, or where the use of forceps has been resorted to before the cervix was dilated. In breech cases, where it is often necessary to expedite the passage of the after-coming head through an imperfectly dilated cervix, laceration is very frequent. Rigidity of the cervix, whether as a result of previous inflammatory mis-

chief, or from cicatricial tissue, or from malignant degeneration, would naturally predispose to laceration of the cervix.

Abortion has been mentioned as a cause, especially where criminally induced; but of this there is little evidence. Instrumental delivery is credited with producing laceration.

Symptoms.—The only indication of laceration of the cervix during labor may be hæmorrhage persisting when the uterus has contracted; this may vary from moderate oozing to a profuse discharge of bright blood. It is, however, comparatively rarely that the utero-cervical artery, or circumflex branch of the uterine artery, is torn through, its own elasticity and its loose connections with the surrounding tissues enabling it to stretch and to escape injury.

If immediate union takes place, which is more likely to occur if the rent be in the antero-posterior or conjugate diameter, no other symptoms beyond the primary hæmorrhage may occur. But, as Goodell points out, if the wound be a deep one, and slow to heal up, or it gapes open and fails to close, symptoms of peri-uterine inflammation are pretty sure to show themselves, such as a rigor, pain in one or other or both iliac regions, accelerated pulse, elevated temperature, etc. Involution is thus retarded, the lochia are profuse, and convalescence is delayed.

If the rent heals up, the patient's health will in time become re-established; but should no union take place, she will never be the same woman that she was before her labor. On getting about again she experiences a sense of bearing-down, weight in the pelvis, constant tired feeling, pain in the back and loins, leucorrhœa, pain and hæmorrhage on coitus with the loss of sexual desire, menorrhagia, and other symptoms.

The nervous system in course of time becomes affected; the patient cannot sleep, she becomes hysterical, low-spirited, and often degenerates into a confirmed invalid. Sterility is a very frequent, but not invariable result, depending a great deal upon the direction and extent of the laceration. Should impregnation take place, abortion is very liable to occur. Neuralgia of the cervix is not infrequent from the constant fretting of the unprotected nerve-filaments, or from imprisonment of a nerve in a dense mass of cicatricial tissue where nature has attempted to establish a cure. Profuse menorrhagia and leucorrhœa, hyperplasia of the cervix, prolapse, retroversion, chronic ovaritis, and other analogous conditions generally ensue. Epithelioma not infrequently results from irritation and perverted nutrition.

Physical Signs.—These are by no means so well marked as might be imagined. Emmet himself says, "After the parts have been torn, and while they are soft enough to be flattened out by pressure on the floor of the pelvis, there remains no evidence of the laceration, and the true condition frequently cannot be detected by either the sight or by sense of touch."

Thomas also remarks: "It is an entirely fallacious position to assume that an examination just after labor reveals the real state of these parts. Examination later on, towards the end of the period

of involution, about the sixth or eighth week, would reveal the true condition of things, and in a great many cases avoid for women lives of suffering and invalidism. It is at this period that every parturient woman should be examined as to the condition of the perineum and cervix uteri."

An ordinary cylindrical speculum is not well adapted for diagnosing these cases, as it tends to close the torn lips and to conceal both the fissure and patch of erosion, or to flatten out still more the convex surface of the cervix, and so obliterate all traces of the fissure that the red, raw, and angry-looking papillæ of the everted mucous lining of the cervical canal will be inevitably mistaken for an erosion—the so-called ulceration of the womb.

The bivalve speculum, which distends the vagina slightly, is also not the form to employ, as the laceration is often not recognizable and always imperfectly appreciated.

Sims's speculum, or some modification of it, should always be employed, the patient being placed in the semi-prone position. Where the laceration extends bilaterally and the tissues are rolled out, it will be necessary to seize the anterior and posterior lips of the cervix with a tenaculum in each hand, and bring them into apposition, when the normal contour of the cervix will be restored. In any doubtful case it will be well to place the patient in the genu-pectoral position.

Emmet points out that laceration on the left side is the most common, due, as is supposed, to the greater frequency of the first cranial position, the left occipito-cotyloid. Double laceration—the bilateral form—is the next most frequent. It is very rare for bad effects to remain after laceration either backward or forward. In practice we have to deal chiefly with the consequences of lateral lacerations, and the effects are more marked when the lesion is double than when confined to either side.

Differentiation.—The condition most liable to be confounded with laceration of the cervix is granular erosion, the so-called ulceration of the cervix. The only certain method of distinguishing the one from the other is to examine the patient in the semi-prone position with a duckbill speculum and a tenaculum, when in the case of laceration the two lips of the cervix can be made to approximate, and all trace of erosion disappears.

Cystic degeneration of the cervix occurs independently of laceration, although in this latter the mucous follicles studding the cervical canal undergo cystic degeneration, and from the amount of inflammatory mischief present, the mucous membrane becomes considerably everted. The same caution will have to be observed in conducting the examination before we shall be able to decide the question.

Simple hyperplasia or hypertrophy of the cervix may simulate an analogous condition complicated by laceration, and it is very important not to overlook this latter, as an operation for the restoration of the normal condition of the cervix will cure not only the laceration, but tend to remove the hyperplasia as well.

Epithelioma of the cervix has often been diagnosed when no such condition existed, the appearance being due to extensive laceration, with eversion of the mucous membrane and extensive erosion, bleeding on the slightest touch. Any one who has witnessed a case where the cervix is bulky from the hyperplasia induced by the constant irritation, where eversion with erosion exists, where the surface is studded with enlarged follicles which feel like shot, or is roughened by red and angry-looking papillæ, perhaps fringed with cock's-comb granulations, where a profuse leucorrhœal discharge and constant sense of discomfort impair the patient's health and exhaust her powers, can readily understand how difficult it must be to discriminate between the two conditions. In fact there is little doubt that the perpetuation of these symptoms under such circumstances is exceedingly prone to pass on almost imperceptibly into the more serious affection. Thomas, Emmet, Breiskey, Veit, and others record their opinion that neglected laceration of the cervix is a fruitful, exciting cause of malignant degeneration of the cervix. For this reason alone, operative interference should always be resorted to for the closure of lacerations attended by local engorgements and irritation.

Prognosis.—Where the laceration takes place through the anterior or posterior lips of the cervix, it generally heals rapidly, leaving scarcely a cicatricial line to mark its course, unless the rent passes beyond the cervix through the septum into the bladder anteriorly, or extends sufficiently into the posterior cul-de-sac to set up an attack of inflammation. When cellulitis occurs at this point, and from this cause, it always induces a most intractable form of retroversion. When, however, the laceration is in a lateral direction, and extends beyond the crown of the cervix, a condition at once arises which will defeat all the reparative efforts of nature. Sterility is a usual, though, as we have seen, by no means a universal result. Some patients seem to be almost unconscious of any laceration having occurred, a process of cicatrization takes place, the granular erosion disappears, the hyperplasia diminishes, and the general health recovers itself to a wonderful extent, the patient continuing to bear children without unusual risk or discomfort. More generally, if the laceration be extensive the patient remains to a certain extent an invalid for many years, until the menopause in fact, when functional activity ceasing, there are no longer any urgent symptoms. Epithelioma unquestionably arises in consequence of laceration in some cases.

Treatment.—If laceration of the cervix be suspected or detected at the time of parturition, and hemorrhage be a prominent symptom, a lump of ice may be passed up to the cervix, a copious stream of hot water allowed to flow into the vagina, or a tampon soaked in a saturated solution of alum or tannin applied to the bleeding surface. If the hemorrhage still persists, it may be necessary to approximate the edges by means of silver sutures. Strict cleanliness must be enjoined, the vagina being washed out twice daily with some antiseptic lotion, such as carbolic acid (1 in 40), or Con-

dy's fluid, so long as the lochia persist. Involution of the uterus should be favored by the administration of ergot or appropriate tonics, not chalybeates; by the adjustment of a Hodge's pessary to prevent the organ becoming prolapsed when the patient begins to get about again; by the employment of the hot vaginal douche twice daily, and by attention to the condition of the general health.

Locally, the application of styptics, such as alum, tannin, sulphate of zinc, or of iodine, powdered persulphate of iron, and other similar remedies must be resorted to. Tampons saturated with glycerin, pure or medicated, may be inserted in the vagina, close up to the cervix, every night. Goodell speaks of tannin $\mathfrak{3j}$, iodine \mathfrak{ss} , or iodoform $\mathfrak{3ij}$, dissolved in an ounce of flexible collodion, as forming an excellent application; also painting the cervix every five days with a saturated tincture of iodine, followed occasionally, before it dries, by a weak solution of the nitrate of silver. This forms a protective and an alterative crust of the silver iodide. The common practice of treating these erosions with the solid stick of lunar caustic is a bad one, on account of the cicatricial tissue which it leaves behind. Such a dense and gristly tissue often pinches peripheral nerve-filaments so severely as to produce ovarian or uterine neuralgia, wholly or partly quenching sexual desire, and causing other psychological disturbances.

Where palliative treatment fails in affording relief, operative measures must be employed if the uterus remains large, becomes displaced, congested, or hypertrophied, the lips everted, and the surface secretes a viscid muco-purulent secretion, the patient meanwhile suffering from neuralgia and reflex irritation.

The operation of trachelorrhaphy ($\tau\rho\acute{\alpha}\chi\eta\lambda\omicron\varsigma$, neck; $\rho\acute{\alpha}\phi\eta$, a seam) should never be undertaken until palliative treatment has first been tried and the general health attended to. If any symptoms of pelvic cellulitis, such as fixidity of the uterus or presence of deposit be detected, all operative procedures should be postponed until this has disappeared.

Preparatory treatment must not be neglected. If the uterus be very congested, the cervix gorged with blood, or studded and stiffened with enlarged Nabothian glands, the denuded surface will probably not unite. Blood must be taken from the cervix by scarification, the congested condition being relieved by puncturing the cysts, the whole lacerated surface being gone over by little stabs in every direction, so as to empty the cysts and reduce the size of the flaps. Churchill's iodine is then to be applied freely over the surface in which the cysts have been punctured. This process must be repeated again and again if deemed requisite. If the patient can rest up, Emmet frequently resorts to the use of a silver wire, passed through each flap at about half an inch from the edge; by twisting the two ends until the lacerated surfaces are brought just into contact, much will be gained by thus temporarily preventing the parts from rolling out.

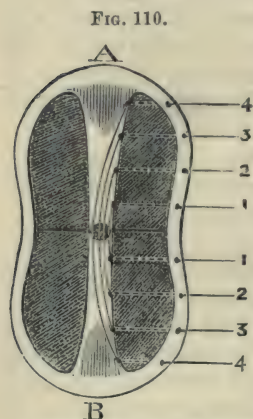
When an operation is decided upon, the week following the menstrual period should be chosen. The patient, being anæsthe-

tized and placed upon the operating-table either in Sims's or the lithotomy position, a duckbill speculum is introduced, a tenaculum fixed in each flap of the laceration, supposing the case to be one of bilateral laceration, and the two flaps approximated. Emmet at this stage used to apply the uterine tourniquet, a species of *écraseur* with watch-spring in place of a chain or wire, slipping it over the cervix below the point of vaginal junction, and then tightening it so as to control hæmorrhage during the operation, which is sometimes excessive when the tissues of the cervix are usually soft. Under ordinary circumstance he finds that the administration of a large hot-water vaginal injection, just before the operation, will so far lessen the bleeding that the tourniquet can be dispensed with.

After separating the flaps fully, the surfaces which have been torn in a double laceration are to be freely denuded from one lip to the other, leaving a broad undenuded tract in the centre from before backward, which is to form the continuation of the uterine canal from the os. Scissors are most convenient to employ, the mucous membrane and a small portion of the parenchyma being removed (Fig. 110). When the two flaps are brought together, A to B, the new canal through the cervix will be trumpet-shaped. This is necessary, since the hypertrophy increases in degree from the bottom of the laceration towards the outer edges of the flaps, and as the uterus gradually returns to its normal size, this new canal will become of a natural and uniform diameter throughout. When it is safe to do so, the process of freshening the surfaces is very much facilitated by drawing the uterus gently down towards the vaginal outlet, and then having the organ steadied by a strong

tenaculum in the hands of an assistant. Having ascertained, by approximating the flaps, that the denuded surfaces will lie in contact with each other when the sutures are passed, these latter are then inserted. Sharp-pointed short needles, held in a needle-holder, are best when the tissues are soft, as there is less risk of hæmorrhage in the track of the needles, but when the tissues are dense and indurated, and therefore less vascular, the lance-pointed needle being easier of introduction, answers best for the purpose.

Three or four sutures are required for each side if the laceration be extensive or double. The needle is introduced about a quarter of an inch from the edge of the denudation, passed through, and in the same way carried through the opposite lip. One after the other wire sutures are passed from above downwards, about a third of an inch



Lacerated Cervix, after denudation on both sides, and application of sutures on one side. (After GALABIN.)

apart, until the lower extremity of the laceration is reached. Then the other side is treated in the same manner, the sutures on both

sides being introduced before any are secured, otherwise great difficulty will be experienced. When the bleeding has been troublesome, it is advisable to pass the first suture through the vaginal tissue a short distance below the angle of laceration. The circular artery, or its branch, from which the oozing generally comes, will be secured by this plan. The sutures are now twisted one by one, the upper ones being first dealt with, until all are twisted, when each one is bent downwards so as to lie flat against the wall of the cervix. The wound is first syringed with carbolized water, to remove all clots before tightening the sutures. If any secondary hæmorrhage from a suture track, in which a vessel has been wounded by the needle, occur, it may be arrested by injections of hot water into the vagina, or by a saturated solution of alum, which is a safe hæmostatic and does not interfere with union by the first intention.

Some operators recommend the absence of etherization, and the use of silk instead of wire, as materially simplifying and shortening the operation, which they assert is comparatively painless, the introduction of the sutures being the only really painful part, and preferable to the nausea following etherization.

The after-treatment is much the same as for any other operation. The patient must remain in bed for ten days or a fortnight, and be kept upon low diet. The bowels should be relieved regularly every, or every other day, the patient being allowed to pass water on the bed-pan for the first day or two. A little warm water should always be injected into the vagina immediately afterwards, to prevent any urine which may have entered the canal from remaining in contact with the uniting surfaces. After the first few days the patient may be allowed to pass water whilst turning over on her hands and knees. A warm carbolic acid lotion should be injected into the vagina night and morning.

The sutures may be removed about the seventh or eighth day, beginning with those above, nearest to the vaginal junction. If there be any tendency to gape, or union has not occurred, or seem very weak, the lower sutures may be left for several days longer, so that the ununited portion may heal by granulation.

An attack of cellulitis or peritonitis may follow the operation; but, considering the good which it accomplishes, it is remarkably free from risk, and when performed with care is perhaps the most successful one in uterine surgery.

CHAPTER XV.

NEW GROWTHS OF THE UTERUS—UTERINE POLYPI.

Uterine Polypi.—These consist of tumors, varying in size, situation, and structure, attached to some portion of the uterus by a pedicle or stem. They are formed by hypertrophy of some of the normal tissues of the organ, and are covered by mucous membrane.

Numerous classifications of the various kinds of polypi have from time to time been suggested, but for all practical purposes an elaborate classification is an unnecessary refinement. We shall therefore describe only the mucous, glandular, cellular, and fibroid varieties.

Mucous and Glandular Polypi of the Uterus.—*Mucous Polypi* consist of hypertrophied mucous follicles enclosed in a stroma of nucleated cellular tissue, covered by a thin vascular mucous membrane, of a bright or deep red color.

They generally originate in the cervical canal, seldom occurring higher up. They vary in size from that of a small pea to that of a cherry, seldom attaining a larger size than this. At first they are sessile, but generally become pedunculated, the polypus descending below the os uteri. They are usually multiple, and others are apt to recur after removal.

Glandular Polypi are those in which the proliferation of the gland follicles predominates over that of the cellular tissue.

Where a single follicle becomes distended with mucoid fluid, it is spoken of as a *cystic polypus*.

Where several large, irregular cavities, communicating with each other, and opening on the surface, lined by cylindrical epithelium, and containing a thick viscid mucoid fluid, occur, they constitute the *channelled polypus* of Oldham.

Where the cavities are relatively small, the cellular tissue predominates, and there is an absence of great vascularity, they have been described as the *fibro-cellular polypus*.

These two latter forms generally grow to a larger size than the former, sometimes as large as a pigeon's or even a bantam's egg.

Barnes describes a *hypertrophic polypus* of the cervix uteri occurring in cases of prolapsus uteri. They are generally small, varying in size from that of a pea to that of a cherry. They are commonly single, but it is not infrequent to find two or three. They generally begin to form just within the ring of the os uteri, which conceals them and protects them from the touch. In structure they are identical with that of the hypertrophied cervix from which the polypi spring, being composed of bands of smooth fibres like those of the unimpregnated uterus.

The **Cellular Polypus** is generally of a pyriform shape, and attached to one wall of the cervix, often having a long and slender pedicle, so that in some cases the growth protrudes even beyond the vulva.

It consists of hypertrophied cellular tissue, covered by mucous membrane, and may attain the size of a hen's egg. They sometimes contain a certain amount of cervical fibrous tissue, and are, therefore, really identical with the fibro-cellular variety.

Symptoms.—There is generally a certain amount of leucorrhœa, with menorrhagia, but not invariably. Several small polypi may exist without giving rise to any urgent symptoms. Where the polypi are situated in the cervical canal, and have not become extruded beyond the external os, dysmenorrhœa from obstruction is not infrequent.

The hæmorrhage is often altogether disproportionate to the size of the polypus. This is explained by the constant hyperæmia kept up by the irritation produced by the presence of the polypus.

Diagnosis.—When concealed within the cervical canal, it may be necessary to dilate the cervix before we are in a position to detect their presence. Even when they have projected beyond the external os it is often difficult to detect them by the sense of touch alone, owing to their being so small and soft, as well as to their retreating easily within the os uteri. On passing the speculum their presence is at once recognized. Where they are within the cervix, a bivalve speculum, by distending the vaginal cul-de-sac, and so dragging open the lips of the os, will often expose the polypi to view when otherwise they would be overlooked.

Treatment.—Where the polypi are small, soft, and pedunculated, they may be safely removed by twisting them off with a pair of ovum or pile forceps, having a catch at the handles, and, if necessary, touching the base with nitric acid, liq. ferri perchl. fort., or nitrate of silver. They should not, as a rule, be cut off with scissors, as troublesome hæmorrhage may occur, though this is rare.

Fibro-cellular polypi, springing from one or other lip of the cervix, occasionally attain the size of a hen's egg. In these cases it is better to employ the single wire, or wire-rope écraseur. It is unnecessary to produce anæsthesia, as the growth is not sensitive and the operation almost painless. The wire can generally be adjusted without the aid of a speculum, but this may be employed if requisite.

Small intra-uterine mucous polypi often give rise to prolonged hæmorrhage. The cervix having been dilated, if necessary, the growth may be seized by the ovum forceps and twisted off, or it may be scraped off with the curette, or destroyed by the application of nitric acid.

Where several small mucous polypi are situated just within the cervical canal, the pressure of a sponge-tent is often sufficient to effect a cure, carbolic acid or iodine liniment being subsequently applied to promote a healthier action of the mucous membrane, and prevent a recurrence of the growths.

Placental Polypi may result from the remains of the placenta, consisting of hypertrophied decidua, projecting into the uterine cavity. Severe hæmorrhage not infrequently breaks out some time after delivery, often very suddenly, in consequence.

Removal by means of the finger, Sims's curette, or wire *écraseur* should be effected. Some styptic, such as the liq. ferri perchl. fort., may subsequently be applied if requisite.

Fibrinous Polypi result from partial abortion. The ovum being driven down by uterine contractions into the cervical canal, its attachments lengthen into a stalk by the stretching and growth of their tissues. The embryo escapes, whilst a portion of the membranes or stalk remains, and by accretions of fibrin-coagula forms the basis of fibrinous polypus (Barnes). Removal by means of the *écraseur* forms the best method of dealing with these.

Fibroid Polypi, or Fibro-myomata, consist of submucous fibroids projecting into the cavity of the uterus, springing from some portion of the wall of the body of the uterus, or more rarely from the cervix. Originally contained in the wall of the uterus, they became extruded in consequence of the contractions that ensue, and gradually acquire a pedicle.

They may remain within the uterine cavity, or ultimately become expelled, the pedicle being drawn out, so that the tumor hangs in the vagina, in some cases even descending so low as to be protruded beyond the vaginal outlet.

In other instances, in place of a pedicle being formed, the tumor is expelled entire. Where uterine action is strong, and the tumor does not separate nor the pedicle lengthen, partial inversion of the uterus may occur, or prolapsus.

Symptoms.—The presence of an intra-uterine polypus stimulates the development of the uterus and produces increased vascularity, thus giving rise to hæmorrhages and leucorrhœal discharge. Acting as a foreign body, it excites uterine contractions, evidenced by spasmodic pains, and pains in the back and loins. Where the tumor occupies the cervical canal, and so impedes the exit of the menstrual fluid, dysmenorrhœa may be a prominent symptom.

Excessive menstruation, or menorrhagia, is generally one of the earliest symptoms. As the tumor enlarges and sets up increased irritation, the hæmorrhage becomes more constant or more frequent, constituting metrorrhagia. This is especially the case where the tumor is still retained in the cavity of the uterus. Hæmorrhage may occur not only from the surface of the tumor, which is generally very vascular, but also from abrasion or ulceration of the cervix, the result of friction.

The leucorrhœa may be merely of a watery, or of a mucous, purulent, or sanguineous character. Where any impediment to the free exit of the discharge occurs, it is often very offensive, giving rise to the supposition of malignant disease. The body of the uterus will be found to be enlarged where the polypus is of any size. Spasmodic expulsive pains occur from time to time, described as uterine colic or bearing-down pains. In some in-

stances nausea and vomiting are present. Irritability of the bladder, and even retention of urine, may be produced if the tumor be large.

Results.—If hæmorrhage be allowed to go on unchecked, constitutional symptoms, such as anæmia, impairment of digestion, and disordered nutrition, ensue. The patient becomes emaciated, exhausted on the least exertion, suffers from palpitation, is nervous and irritable, and ultimately succumbs if relief be not afforded.

In married patients sterility usually occurs, but should impregnation take place, abortion is pretty sure to follow. Metritis, peritonitis, septicæmia, and even gangrene and sloughing of the vagina, occasionally ensue.

In some instances the polypus is expelled, becoming detached from the uterus. In others it may undergo a process of calcification, fatty degeneration, ulceration, or sloughing. Prolapse or partial inversion, and even spontaneous rupture of the uterus, may ensue.

Diagnosis.—Prolapsus uteri and inversion are the conditions most liable to be confounded with a polypus that has been extruded from the uterus.

In prolapsus the os uteri is detected at the most dependent portion of the tumor, the uterine sound can be made to pass within the os, the structure is sensitive to pressure, the inverted vagina can be felt moving over the surface of the tumor, the fundus uteri is absent from its normal position behind the pubes, and the upper portion or neck of the organ, really the body of the uterus, does not at all resemble the narrow pedicle of a polypus.

In partial inversion we detect a rounded tumor encircled by a ring, but the sound will not pass up more than an inch beyond this margin. If the abdominal walls be lax, the cup-shaped depression of the fundus uteri may be felt on deep pressure behind the pubes.

In complete inversion there is no os uteri to be detected. The neck of the tumor is continuous with the roof of the vagina, and the fundus uteri cannot be felt in its normal position behind the pubes by combined rectal and abdominal touch.

For further details see diagnosis of "Inversion."

A fibroid polypus, hanging from the cervix into the vagina, may be recognized by the following characteristics:

The tumor is generally more or less pyriform in shape, mostly solid, smooth or lobulated on the surface. Its neck is usually smaller than the lower portion; the pedicle can be traced into the os uteri, which surrounds it like a ring, or can be felt springing from one or other lip of the cervix, partially surrounded by the ring of the os. The structure is not sensitive to pressure. There is no orifice corresponding to the os uteri.

The fundus uteri can be felt either in its normal position or in some other portion of the pelvis. The sound can be passed up within the os uteri the normal distance, and can often be made to sweep round the pedicle of the polypus.

When the polypus is retained within the uterus it is often more sessile than pedunculated. If small, the sense of touch may not be able to distinguish it, nor is it visible to sight on passing the speculum. It may, however, project through the os uteri, when the cervix is relaxed from menstruation or excessive hæmorrhage, if uterine contractions are present, and again disappear within the uterus when the contractions cease and the cervix closes.

Where the symptoms point to intra-uterine polypus, the cervix should be dilated by means of tents, and the cavity of the uterus carefully explored.

Cases have been recorded in which a submucous fibroid, having been expelled from the uterus, remaining pedunculated in the vagina, has formed attachments to the surface of this canal, so that, on passing the finger within the passage, the impression was conveyed that malignant degeneration of the cervix, extending to the vaginal walls, existed. The history of repeated hæmorrhage, profuse leucorrhœa, often fœtid in character, emaciation, and other constitutional symptoms, all seemed to point to the same conclusion.

In these cases it may be extremely difficult to arrive at a conclusive diagnosis. The points most likely to assist us in recognizing the nature of the case will be the length of time the symptoms have continued, the inability to detect any central orifice corresponding to the os uteri, or to pass the sound within the mass, as can generally be done in cases of cancer, and that on careful exploration we shall find that the polypus is not uniformly adherent to its entire circumference, but either the sound or finger can be made to pass between the surface of the tumor and the vaginal wall.

Treatment.—In cases where the patient has been subject to profuse menorrhagia for many consecutive months, and her general health much deteriorated in consequence, before the presence of an intra-uterine polypus has been detected, we must be careful not to resort too hurriedly to intemperate efforts at removal.

It may be necessary to adopt palliative measures for a short time, in order to repair the damage done to the system before attempting any operative procedures, so as to lessen the risk of septicæmia, shock, or hæmorrhage.

Rest in bed during the menstrual period; ergot, cinchona, and acid given internally; swabbing the bleeding surface over with a strong solution of alum (1 in 12), or the perchloride of iron, will tend to check the excessive hæmorrhage.

Dilating the cervix with laminaria tents, or Barnes's bags, will not only facilitate diagnosis as to the exact situation of the growth, but also enable us to operate with greater freedom, and allow the ready passage of the tumor when separated from its attachment.

If the cervix have been already dilated by the expulsive efforts of the uterus forcing the polypus against the cervix, but still the opening is not sufficiently large to admit of the removal of the tumor, the walls of the cervix may be divided on either side, nearly as far as the vaginal junction.

Where the polypus protrudes from the cervix into the vagina,

even though the symptoms may not be very urgent, the wiser plan is to remove it, as sooner or later mischief is likely to occur.

The various methods at our disposal are torsion, ligature, removal by means of the *écraseur*, or by some process of excision, or by the galvano-caustic wire.

Torsion is only applicable to polypi with slender pedicles, and should never be employed if the stalk be thick or firm. The operation is painless; anæsthesia therefore is not requisite. In case of small polypi the pedicle may be seized with ovum or pile forceps, having a catch at the handles (Fig. 111), and the growth gradually twisted off. There is seldom any hæmorrhage resulting, but should this occur the base may be touched with the actual cautery, strong liq. fer. perchl., nitric acid, or other agent. The operation may be performed with the patient lying in the semi-prone position, without the aid of a speculum if the pedicle be slight, but if hæmorrhage be at all likely to occur, or the operator prefer it, a Cusco's bivalve or a Sims's speculum may be passed, so as to expose the pedicle before applying the forceps, and also allow of any application being made to the base to restrain hæmorrhage.

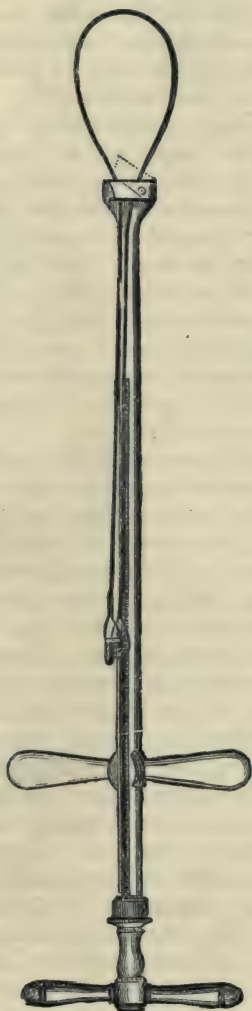
The ligature was formerly employed with great frequency to produce strangulation of the pedicle, the tumor being allowed to separate by sloughing or mortification.

As this process generally occupied two to ten days, according to the size of the pedicle, and during this time a continuous offensive discharge was produced, inflammation not infrequently extended from the pedicle to the substance of the uterus. Metritis, peritonitis, pyæmia, septicæmia, phlegmasia dolens, often resulted, in many cases terminating fatally, so that this method of treatment is now, very properly, seldom resorted to. Even removal of the tumor below the seat of strangulation, although it diminishes the source of decomposition, does not lessen the danger of absorption.

Ecrasement, by means of the wire-rope *écraseur* (Fig. 112), constitutes the simplest, safest, and most expeditious method of removing polypi, combining the advantages of excision with those of the ligature, without incurring the dangers incidental to the latter. The pedicle is cut through within a few minutes, without risk of subsequent hæmorrhage, or of any of the evils mentioned as likely to occur from the employment of the ligature. If the polypus occupies the vagina, or be easily accessible within the uterus, the tumor not being unusually large, nor the pedicle very difficult to reach, it is seldom necessary to produce anæsthesia, as the tumor is insensitive, and the operation itself therefore painless. But if the patient be very nervous or sensitive, and the growth difficult to deal with, it may be well to give an anæsthetic to keep the patient from moving, and to enable us to pass the hand within the pelvis, so as to explore thoroughly the size and relations of the tumor before proceeding to remove it by means of the *écraseur*. If the tumor be first seized by a vulsellum and drawn down low in the pelvis, adjustment of the wire of the *écraseur* is thereby often greatly facilitated.

The patient lying in the semi-prone, left lateral, or lithotomy position, as the operator may deem expedient, the wire loop of the *écraseur* is passed over the base of the tumor by the help of the fingers, or a director notched at its extremity, until the loop is

FIG. 112.



Wire-rope *Écraseur*, with Heywood Smith's Adjustment to allow of the wire being fixed after being passed round the base of a tumor.

beyond the equator of the polypus. The end of the *écraseur* is then pressed up and the wire tightened somewhat, so that it adjusts itself to the pedicle near its attachment to the uterine wall. It is not absolutely necessary to include the whole length of the pedicle

up to its insertion, as the portion remaining ultimately becomes absorbed or atrophied. Where the tumor is sessile on the fundus uteri, there is often a tendency for this latter to become partially inverted, more especially if traction be exerted on the tumor by means of vulsella. Care will be needed therefore not to include any portion of the uterine wall. If this should occur pain will be produced, and thus give us timely warning that we are not dealing with the polypus simply. Should no such inconvenience arise, the loop having been properly adjusted, the screw of the *écraseur* is gradually tightened until the pedicle of the tumor is cut through and the polypus is left lying loose in the vagina, when it may be seized and drawn out by means of a vulsellum (Fig. 113), or large ovum forceps. Excision by means of scissors is not unattended by risk of hæmorrhage, although the operation was formerly extensively practised.

The Polyp tome (Fig. 114) was also devised with a similar object, when the pedicle was higher up in the uterus, and could not readily be reached by means of scissors or knife. The employment of the *écraseur* has almost entirely superseded this method of removal. It is not a plan that can be recommended, and therefore should not be resorted to unless in exceptional cases. The use of the actual cautery to arrest the hæmorrhage will often be requisite.

The galvano-cautery wire should be employed whenever practicable in those cases where the tumor is implanted in the uterine wall or sessile, the base of the polypus being very thick, especially if we have reason to suspect that it is unusually vascular. "It not only cuts without the application of force through the hardest tissue, but being brought to a white heat by the electric current which passes through it, it sears the open vessels, checks hæmorrhage, and prevents septicæmia" (Thomas).

It occasionally happens in cases of large intra-uterine polypi, that even when the pedicle is divided great difficulty is experienced in removing the growth. If this cannot be accomplished by a reasonable amount of traction, it will be better to cut it up and remove it piecemeal, either by dividing it in half with the wire of the *écraseur* again applied, or by cutting through with strong scissors, or by dilating still more the cervix by means of Barnes's bags, or by incising the cervix. An unusually large fibroid polypus lying loose in the vagina, after division of the pedicle, may also offer considerable difficulty in extraction. It may be necessary to apply a pair of obstetric forceps, and exert traction as in the delivery of the fetal head. If the vaginal outlet be too small to admit of the escape of the tumor, or the perineum be so rigid as to preclude the delivery of the tumor, bilateral incision of the perineum, or breaking up of the tumor itself, as before indicated, must be resorted to. Nélaton's forceps were constructed for this purpose.

FIG. 114.



Aveling's
Polyp tome.

As a rule, it is inexpedient to perform any operation for the removal of fibroid polypi in the consulting or out-patient room. It is better to have the patient undressed in bed at the time, so that she may remain absolutely quiet for some few days afterwards. The risk of hæmorrhage or other accidents is thereby lessened. Ergot should be given to promote the contraction of the uterus. Some disinfectant vaginal injection may be employed morning and evening for the first week or two following the operation. If any ulceration of the cervix or vagina existed previous to the removal of the tumor, and this does not heal readily, it may be well to touch the surface with carbolic acid, nitrate of silver, or other similar agent.

The stump usually becomes atrophied and in time disappears. If much discharge from the surface occurs, this may be swabbed over with the tincture of iodine, or an injection of iodine and water employed.

Some preparation of quinine and iron, with strychnia, is generally indicated to recruit the health after the removal of the polypus, but such preparations should be avoided before this has been effected, as otherwise they tend to increase the hæmorrhage.

CHAPTER XVI.

NEW GROWTHS OF THE UTERUS—*continued*.*Fibroid and Fibro-cystic Tumors of the Uterus.***Fibroid Tumors of the Uterus, or Fibro-myomata.**

Definition.—The tissue of the uterus is very apt to undergo localized hypertrophy, perfectly innocent in character, forming more or less circumscribed nodules, which have been termed fibroid tumors. Other terms, such as myoma, fibroma, hysteroma, fibromyoma, fibrous tumor, and numerous others have been given to these growths. The term myo-fibroma or fibro-myoma best expresses the exact nature of the growth, which from its resemblance (*σιδωδες*) to fibrous tissue is generally spoken of as fibroid.

Pathological Anatomy.—A fibroid tumor is simply a localized hypertrophy of the uterine tissue from increased nutritive activity at some point in the muscular layer, growing by an independent proliferation of its own cells; a fibroid neither infiltrates adjacent tissues nor becomes intimately incorporated with them, simply displaces them as it increases in bulk. In its early stage the tumor consists almost entirely of true muscular tissue, hence the term myoma, the tissue of the tumor being continuous with that of the uterus. This is especially the case in the softer and more rapidly growing varieties, found in younger women, than the harder varieties. In older tumors the connective tissue is often exceedingly abundant, hence the term fibroid. They are encapsuled, hard, and resisting to the knife, the section being white and glistening, creaking when cut, but slightly vascular and of low vitality.

Causation.—Nothing certain is known as regards this. Celibacy and sterility are both supposed to exercise some influence in their production, owing to the constantly recurring congestion due to uninterrupted catamenia, and in addition the unfruitful sexual excitement in cases of the latter. The congestions and extravasations of dysmenorrhœa, the localized inflammations, the result of abortions or of parturition, are all supposed to favor the growth of fibroids. Hereditary predisposition seems to exercise some influence, the African race being particularly liable to them, as also to a very early development of them. Inasmuch as fibroid tumors occur only during the child-bearing period, this is spoken of as a predisposing cause.

Sexual intercourse always aggravates their symptoms, and marriage is pretty sure to start the growth of one hitherto dormant. The periodical stimulus of menstruation encourages their growth, and the enlargement of the uterus during pregnancy often stimulates the growth of these tumors.

Frequency.—Fibroid tumors are exceedingly common in the uterus. There is perhaps no organic change in the uterus more common than the development of tumors of this character (Barnes). As in a large proportion of cases they occasion no marked distress and entail little danger to health or life, their presence is often not even suspected.

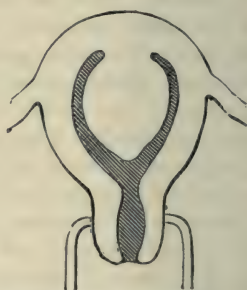
Varieties.—Fibroid tumors almost invariably commence in some portion of the wall of the body or fundus of the uterus, very rarely indeed below the level of the os internum. Owing to the muscular contractions induced by the presence of the tumor in the substance of the uterine wall, it generally becomes compressed towards or grows in the direction of least resistance, bulging either on the outer or inner surface of the uterus, although sometimes it remains imbedded in the uterine wall and continues growing there. Since this accident of position determines to a great extent the symptoms

FIG. 115.



Diagram illustrating the varieties of Fibroids (modified from EMMET). 1. Sub-peritoneal or sub-serous. 2. Interstitial or intra-mural. 3. Sub-mucous.

FIG. 116.



A Sub-mucous Fibroid being gradually transformed into a Fibroid Polypus. (After THOMAS.)

produced as regards especially pain and hæmorrhage, and also influences the prognosis and treatment, it has very appropriately been chosen as the basis of their classification, thus:

Sub-peritoneal, or *sub-serous* when they project from the exterior of the uterus.

Interstitial, *intra-parietal*, or *intra-mural*, when they remain imbedded in the substance of the uterine wall.

Sub-mucous or *Intra-uterine* when they project into the interior of the uterus.

In the two latter varieties the uterus itself is generally increased in bulk, and its cavity enlarged. In the sub-peritoneal, the uterus is more often normal in size or even atrophied.

The sub-mucous fibroid not infrequently gives rise to so much uterine contraction that the attachment in time becomes so slender and pedunculated as to constitute the growth a fibroid polypus.

Fibroid tumors vary in size from that of a pea to that of an adult head, or even larger, and in weight from a drachm to as much as fifty pounds or more. They may be single or multiple the former consisting of one bundle or mass, or compound, con-

sisting of several masses packed together in close approximation, when they are termed conglomerate, each constituent mass appearing surrounded in a separate matrix, whilst all are encapsuled in uterine tissue.

Multiple tumors are those in which separate masses occur in different parts of the uterus. There is no limit to their number; as many as thirty-five tumors, varying in size from that of a marble to that of a foetal head, have been found attached to one uterus. When numerous, they are generally of the sub-peritoneal variety.

They are generally more or less globular in form at first, but when multiple often become irregular and undulated from compression.

They vary in density, according to the stage of development, from soft elastic to nearly cartilaginous.

In color they vary from red to nearly pearly white. They occur more frequently in the posterior than the anterior wall of the uterus, often producing flexion of the organ, one in the posterior wall producing retroflexion, and *vice versâ*. They are enveloped by a considerable vascular network, more especially when submucous, but there is a comparative absence of vessels in the interior, and consequently they possess only a low vitality.

Their rate of growth is not uniform, but is influenced by the ovarian stimulus. They are rarely found before puberty, their growth being most active during the period of sexual activity, and as a rule cease to grow after the climacteric, in many cases diminishing even in bulk.

Symptoms.—These vary, depending upon the site of the tumor. The sub-peritoneal tumors, unless very large, often cause but slight manifestations of their presence. The intra-mural or interstitial generally produce hæmorrhage as well as pain, whereas the sub-mucous more often give rise to hæmorrhage only as a prominent symptom.

The hæmorrhage generally assumes the form of menorrhagia, the period being profuse and prolonged. This is due not so much to the increased surface as to the active hyperæmia of the mucous membrane produced by the presence of the tumor, and possibly also to the passive hyperæmia, the result of pressure.

In other instances the hæmorrhage is more or less continuous—metrorrhagia—there being no well-marked intervals between the recurrence of the flow.

Profuse leucorrhœa commonly alternates with the hæmorrhage, at times being of a serous character and somewhat foetid, giving rise to the suspicion of cancer.

Pain is generally most severe in the case of intra-mural fibroids. It is more or less of a spasmodic intermitting character, a uterine tenesmus, due to the muscular contractions endeavoring to force or expel the tumor out of the wall of the uterus. Where the position of the tumor interferes with the patency of the cervical canal or tends to produce ante- or retro-flexion, the exit of the fluid from the body of the uterus may be so impeded as to cause most dis-

trressing pain, the so-called obstructive dysmenorrhœa. Even where the canal is patulous the increased hyperæmia may give rise to symptoms of congestive dysmenorrhœa. Where the tumor is sufficiently large to become impacted in the pelvis, the pain is due to pressure upon the surrounding organs and structures. Pressure upon the sacral plexus may cause excruciating pain in the form of sciatica; this may only be present at the menstrual epochs when the uterus is increased in bulk from the congestion present at those times.

Dragging pain is often complained of when the bulk of the uterus is much increased.

When the tumor has attained the size of the gravid uterus at the fourth month, like this latter organ it not infrequently rises above the pelvic brim, dragging the uterus with it; but this is by no means uniformly so. In many instances, more especially when the fibroid is sub-peritoneal and attached to the posterior wall of the uterus, it becomes caught under the sacral promontory, and thus impacted in the pelvis, when a fresh set of symptoms, from pressure, become developed.

The neck of the bladder being compressed, frequent micturition, vesical tenesmus, or retention of urine result, more especially at the menstrual periods when the uterus is more congested and swollen. If this condition be unrelieved, the ureters in time become distended, and then the pelvis of the kidney, constituting hydronephrosis. The rectum ultimately becomes compressed, the fæces being passed in a ribbon-like form; constipation is very troublesome; and at length complete obstruction may occur, the symptoms closely simulating those of strangulated hernia.

Sciatica from pressure on the sacral plexus; œdema of the legs from pressure on the iliac veins; and even gangrene of the vagina from obstruction to the local circulation, may result.

Dysmenorrhœa, dyspareunia, and sterility are commonly found in cases of fibroid of the uterus; should impregnation, however, take place, a marked tendency to miscarriage and very troublesome hæmorrhage are noticed; or if pregnancy advance to full term serious difficulty may be experienced at the time of parturition. Provided the tumor be sub-peritoneal and not impacted in the pelvis, pregnancy may advance to full term, and delivery be effected naturally.

Physical Signs.—These will vary considerably, depending upon the size and situation of the fibroid. If this be of any size, the uterus will be found on vaginal examination to be enlarged, heavier than normal when poised on the finger, less mobile, the surface irregular or nodulated, and harder than natural.

On conjoined manipulation these several points will be still more plainly made out, the mass being recognized as forming an integral part of the womb.

Differentiation.—The conditions most liable to be confounded with fibroid tumors are partial or incomplete inversion, pregnancy, ante- or retro-flexion, retro-uterine hæmatocele, peri-uterine cellu-

litis or abscess, ovarian tumors, fecal accumulation in the rectum, and cancer of the body of the uterus.

Partial or incomplete inversion may generally be recognized by the history of its sudden production following parturition, the sensitive condition of the tumor, the recognition of the depression of the fundus uteri, and the shortening rather than increase in the length of the uterine cavity. The converse of this generally holds good in cases of fibroid tumor.

In pregnancy there is usually cessation of the catamenia with other minor symptoms to guide us. The uterus is enlarged in a uniform, symmetrical manner, more or less central in position, soft in consistence, giving a feeling of tenseness when grasped externally, alternately hardening and becoming soft under the hand. The womb grows rapidly. Pregnancy may co-exist with a fibroid. The cervix is bulky and soft, the os somewhat patulous, of a violet hue when seen through the speculum.

In fibroid, menorrhagia is usually a prominent symptom. The uterus is irregularly enlarged, often bulging to one or other side, harder than normal, giving a feeling of solidity when grasped by the hand. The growth is slow. The cervix is often lost in the tumor, or if not is fairly normal in size and consistence, but is not so continuous in outline with the lower segment of the womb.

Anteflexion can only be differentiated from a fibroid of the anterior wall by the employment of the uterine sound. The symptoms will often point to one or other condition. Amenorrhœa more often is associated with anteflexion and menorrhagia with fibroid.

Retroflexion may generally be distinguished from fibroid in the posterior wall of the uterus, by the direction in which the sound passes and the disappearance of the tumor when the displacement is corrected. The fundus uteri is more sensitive and less dense than a fibroid. On conjoined manipulation the fundus uteri is absent from its normal position behind the pubes in the case of retroflexion, not so with fibroid.

In some cases it is extremely difficult to differentiate between a retroflexed fundus, a fibroid tumor, a prolapsed and enlarged ovary, and an extra-uterine gestation. The ovary is generally more sensitive and less firm than a fibroid, and can be moved independently of the uterus, except in cases where adhesions have taken place.

The diagnosis of extra-uterine gestation cysts is fully discussed under this heading.

Retro-uterine hæmatocele comes on suddenly with well-marked symptoms of faintness, shock, and pelvic discomfort. The swelling is less defined, merging more into the surrounding parts, and is softer than in the case of a fibroid.

Peri-uterine cellulitis or abscess may also generally be distinguished by the history of the attack, following abortion or parturition, the constitutional symptoms, the fixidity of the uterus, more diffused swelling, less defined outline, and tenderness to touch.

In fibroid the symptoms have been of longer standing, menorrhagia being a prominent one, and the history is less defined.

Ovarian tumors of moderate size when prolapsed or impacted in the pelvis may cause difficulty in diagnosis. The uterus can often be made to move independently of the tumor, which is seldom so dense as a fibroid. The history of menorrhagia is less marked, and more distress is caused by pressure than in the case of fibroid. The cervix uteri is more distinct, not merging in the mass as in fibroid. The sound seldom enters beyond the normal distance in ovarian cases, whereas the uterine cavity is often considerably elongated in cases of fibroid.

Fluctuation can generally be detected in ovarian cysts. The ulnar edge of the hand can be passed down deeply between the tumor and pubes when it is ovarian, but not so when uterine.

Fæcal accumulation may generally be distinguished by indenting the mass by firm pressure with the finger, by discovering the nature of the enlargement on passing the finger per rectum, by being able to move the uterus independently of the mass, by the absence of any marked uterine symptoms, and by the history of constipation.

Cancer of the body of the uterus is comparatively rare. There is generally more pain than in cases of fibroid, hæmorrhage is more irregular, and the discharge is generally offensive. The diagnosis is more fully discussed when speaking of cancer.

To determine the diagnosis between intra-mural and submucous fibroids it may be necessary to explore the cavity of the uterus with the finger. This may sometimes be possible at the time of the menstrual period, without having to resort to artificial dilatation of the cervix, inasmuch as the uterine contractions serve to open the os uteri; but should this not be practicable the cervix may be dilated in the usual way by means of sea-tangle or sponge tents.

Sub-peritoneal fibroids may often be distinguished by their hard, irregular, nodular outline, and by the fact of their being multiple.

It should always be remembered that, unless there be any well-marked contra-indication, exploration by means of the hand in the rectum may enable us to clear up a doubtful diagnosis when all other means have failed. It should, however, never be resorted to unless there is a clear indication for its necessity.

Progress and Termination.—The rate of growth is not uniform. A fibroid may remain comparatively small and inert for many years, growing very slowly until the menopause, when further growth is usually arrested, the tumor remaining stationary or undergoing a certain amount of atrophy.

In other instances a fibroid that has increased very gradually in size may, without any assignable cause, suddenly commence growing rapidly until it attains an enormous size, as much as fifty pounds' weight; this, however, is rare.

Menstruation, utero-gestation, and the menopause exercise a distinct influence over the growth of fibroids. During menstruation they become congested, enlarged, and sensitive, hæmorrhage, pain, and symptoms of pressure being more evident at these times.

During pregnancy their growth is often commensurate with the development of that of the uterus, and following delivery a marked

retrograde metamorphosis or even a spontaneous absorption of the tumor occurs *pari passu* with the process of involution, probably by a similar process of fatty degeneration.

After the menopause, when the uterus itself undergoes senile atrophy, the nutrition of the fibroid becomes correspondingly impaired. The presence, however, of these tumors generally postpones the menopause for some few years, so that even at the age of fifty a patient may have periodically recurring hæmorrhages.

Cretification, or, more properly speaking, calcification of fibroids, is not infrequent after the menopause, a species of peripheral incrustation or of calcareous infiltration taking place, the tumor being permeated with the phosphate and carbonate of lime. The vascular attachment of the tumor being thus impaired, its nutrition is materially interfered with, and a uterine calculus is formed which may either remain inert or be expelled *per vaginam*. The process is analogous to the cretaceous transformation of pulmonary tubercle.

Spontaneous disappearance of the tumor has been recorded in some instances. This may be due to the process of involution following delivery, or to sloughing of the uterine wall covering the tumor, when the latter becomes expelled by uterine contractions, or breaks down and comes away in the form of *débris*, not infrequently proving fatal by the production of septicæmia.

It is doubtful whether fibroid tumors ever undergo malignant degeneration. A fibroid may co-exist with a cancer in the same womb. The putrid sloughs of a disintegrating tumor may be readily mistaken for cancer, or the normal structure of the uterus or vagina being first the seat of cancer, the disease may spread and invade the fibrous tumor (Barnes). It is, however, comparatively very rare for the two conditions to be associated.

Fibroid tumors are occasionally the subject of œdema, inflammation, gangrene, apoplexy, and cystic degeneration. This latter condition will be considered separately.

Speaking generally, fibroid tumors do not prove fatal. Death may result from hæmorrhage and exhaustion, from sloughing and septicæmia, from peritonitis, from pressure interfering with the functions of the bladder and kidneys, or of the bowels, or from some intercurrent secondary disease induced by the degraded state of the system generally.

Should pregnancy complicate the question, the risk to life is greatly enhanced. Parturition may be difficult, dangerous, or impossible. By hindering firm uterine contraction, labor may be retarded, or uncontrollable post-partum hæmorrhage induced. The tumor itself may be so bruised by the pressure as to kindle up a fatal peritonitis, or may break down and give rise to septicæmia.

Treatment.—This may be either palliative or curative. As a general rule we are only called upon to palliate symptoms and carry our patient on safely until the menopause, which in cases of interstitial and submucous fibroid is generally postponed for many years beyond the normal period. *Hæmorrhage* being usually the

most prominent symptom, is what most frequently calls for attention. Much may be done in the way of prevention to check immoderate losses. If single, the patient should on no account even contemplate marriage, for this condition invariably aggravates the symptoms, and if pregnancy should happen to occur, the dangers are greatly increased. Married patients should be advised to abstain as far as possible from sexual intercourse. Just previous to the menstrual period, a saline aperient may prove of service in relieving the precursory engorgement of the pelvic viscera. The patient should, if the case be severe, remain quiet in bed. The diet should be limited, and stimulants avoided unless absolutely requisite.

During the period, if the loss be profuse, ergot is most likely to exercise a beneficial influence in restraining it. Thirty minims to a drachm of the liquid extract may be given every four or six hours. In the interstitial variety this seldom fails to do good, though it may increase the hæmorrhage in the submucous variety.

Gallic acid is probably the next most valuable hæmostatic, and may be given in scruple doses, alone, or combined with the ergot. The glyc. acid. gallici in \mathfrak{zj} (gr. xv) to \mathfrak{ziss} doses forms a convenient method of administration.

Cinchona, \mathfrak{mxx} to \mathfrak{mxxx} of the tincture, or even more, is a useful addition to the two former.

The following mixture may be prescribed :

R. Ext. ergotæ liq. $\mathfrak{v}\mathfrak{j}$ – \mathfrak{ziss} , glyc. acid. gallici \mathfrak{ziss} – $\mathfrak{z}\mathfrak{i}\mathfrak{j}$, tinct. cinchonæ, \mathfrak{zss} – \mathfrak{zj} , tinct. chlorof. co. \mathfrak{zj} – \mathfrak{zss} , syr. aurantii \mathfrak{ziss} , inf. rosæ acid. ad $\mathfrak{v}\mathfrak{j}$ – $\mathfrak{v}\mathfrak{i}\mathfrak{i}\mathfrak{i}$.—M. One tablespoonful in a wineglassful of water every three, four, or six hours.

If much pain be present as well, it may be necessary to add liq. opii sed. $\mathfrak{z}\mathfrak{i}\mathfrak{i}\mathfrak{j}$ – $\mathfrak{z}\mathfrak{i}\mathfrak{v}$ to the mixture.

Quinine gr. \mathfrak{ij} – \mathfrak{iv} , with acid. sulph. arom. \mathfrak{mxx} – \mathfrak{xxx} , every three or four hours, is sometimes of much service.

The tincture of cannabis indica in $\mathfrak{m}\mathfrak{xv}$ – \mathfrak{xx} doses given in mucilage is highly spoken of by some authors.

Bromide of potassium in gr. \mathfrak{xx} to \mathfrak{xxx} doses in some instances acts even better than styptics.

Digitalis, $\mathfrak{m}\mathfrak{x}$ to $\mathfrak{m}\mathfrak{xv}$ of the tincture, or \mathfrak{zj} of the fresh infusion, more especially if there be any cardiac complication, often acts very beneficially.

Strychnine, alum, turpentine, hamamelys, vinca major, acetate of lead and opium, have also their advocates.

In the interval between the menstrual periods every effort should be made to improve the tone of the general health.

Iron in the form of the tinct. ferri perchlor. $\mathfrak{m}\mathfrak{x}$ – \mathfrak{xx} , tinct. ferri pernit. $\mathfrak{m}\mathfrak{x}$ – \mathfrak{xx} , combined with strychnia, ergot, cannabis indica, digitalis, or arsenic will usually be indicated.

The liq. hydrarg. perchlor. in \mathfrak{zj} doses, combined with potassii bromid. gr. \mathfrak{x} – \mathfrak{xx} , or potassii iodidi gr. \mathfrak{ij} – \mathfrak{v} , or with arsenic and iron, occasionally proves of service.

Ergot in the form of subcutaneous injection will often succeed when its internal administration fails.

The essential principle of ergot, sclerotic acid, in half-grain doses; extractum ergotæ liquidum in \mathfrak{m} x-xxx doses, diluted with an equal amount of water; ergotin in gr. ij-iv doses; or Bonjean's ergotin in \mathfrak{m} iij-v doses, dissolved in the same amount of water, are the most usual forms.

Whatever preparation be employed should be freshly prepared. The best situation is to inject deeply into the substance of the gluteus muscle, as there is less likelihood of its setting up inflammation or causing abscess, though some local induration and redness is generally produced. To be of any service, it will mostly be necessary to repeat the injection on alternate days for some two or three months. The pain resulting from uterine tenesmus is generally much increased. This method is useless in the case of sub-peritoneal fibroids.

Should medicines fail in checking or arresting hæmorrhage, we must then have recourse to other measures. The application of a hot-water bag to the lumbar region, the injection of hot water *per vaginam*, or of cold water, or even iced water thrown up the rectum, may all be tried. Where the hæmorrhage is very persistent or very profuse, we can at once check it by the insertion of a sponge-tent into the cervix—a far more scientific plan than inserting vaginal tampons. By this plan we not only check the hæmorrhage at once, but also facilitate further exploration of the interior of the uterus by dilating the cervix, thus allowing the application of any styptics if necessary. But in addition to this, it is a curious and unexplained fact that mere dilatation of the cervix is often sufficient of itself to lessen the frequency and the duration of the hæmorrhagic attacks for some time to come. Whether it is by relieving tension, preventing the retention of blood or clots, allowing more room for the tumor (thus relieving the veins from the engorgement due to pressure), or by exciting uterine action and so causing contraction, is not known. The fact remains that the hæmorrhage is checked.

Any theoretical objections as to the risk of blood being forced back along the Fallopian tubes, causing hæmatocoele or setting up peritonitis, are outweighed by the practical result that such a condition has not been recorded. This may be explained by the blood rapidly coagulating, and not remaining in a tarry uncoagulable condition, as noticed in cases of hæmatometra from imperforate hymen.

Hæmorrhage having thus been arrested, the patient's powers may be rallied by appropriate nourishment or stimulants.

Dilatation may be accomplished either by means of as large a carbolized sponge-tent as the cervix will accommodate, by the insertion of several small laminaria tents, packing the cervix as tightly with them as prudent, or by incision of the cervix. If on removal of the tents at the end of twenty-four hours hæmorrhage still recurs to any extent, we must then swab out the interior of the uterus with the strong liq. ferri perchlor., ferri persulph., chromic acid, nitric acid, or some equally powerful styptic.

Where the uterine cavity is so tortuous as to preclude the appli-

cation of the styptic to the whole of the surface by means of the swab, it may be necessary to inject the cavity with tincture of iodine, tinct. ferri perchlor., or other appropriate styptic solution. The precautions elsewhere mentioned must be strictly observed. Injection should never be employed unless the canal be fully dilated.

In order to swab out the interior, place the patient in the left lateral or semi-prone position, pass either a Sims's, bivalve, or Ferguson's speculum up to the cervix. This latter should then be seized with a tenaculum or Sims's hook, so as to keep it steady and prevent it receding from view. Having coated several Playfair's probes with cotton-wool, the interior is first mopped out as clean as possible from clots and blood; the styptic is then passed in and the lining membrane thoroughly swabbed over, a second application being used if necessary. Any excess is carefully neutralized with carbonate of soda, a plug soaked in a saturated solution of this being left in the vaginal cul-de-sac as the speculum is withdrawn, so as to prevent the possibility of any of the styptic running down into the vagina.

If after resorting to dilatation of the cervix by means of tents and swabbing the cavity with strong styptics the hæmorrhage still persists, incision of the cervix, either unilaterally or bilaterally, should be proceeded with.

It is not necessary to incise very deeply the os internum, but the lower portion of the cervix should be freely divided. This may be effected by means of the metrotome in the usual manner; by a curved bistoury, the speculum being employed to enable the operator to see exactly what he is doing; or by the long-handled, curved scissors, the cervix being steadied with a tenaculum or hook.

Incision of the cervix not only tends to arrest hæmorrhage, but also exercises a beneficial effect in modifying the nutrition of fibroid tumors.

If this method be not sufficient to arrest hæmorrhage, the tumor being interstitial or a sessile submucous one, a longitudinal incision may be made through the capsule investing the tumor, so as to allow the mucous membrane to retract, and thus diminish the hæmorrhage. The vascular supply being interfered with, the growth of the tumor may be arrested, or its expulsion ultimately accomplished by the persistent administration of ergot. The cervix having been previously fully dilated or incised, a long-handled, curved, probe-pointed bistoury is passed up into the uterus as far as the finger will reach, and is then drawn down over the surface of the tumor, freely dividing its capsule, and cutting into its substance to the depth of about half an inch.

In addition to our efforts to restrain hæmorrhage, another important indication is to obviate any displacement of the uterus by a properly adjusted pessary, and to avert any symptoms of pressure by preventing the tumor becoming impacted in the pelvis.

If attention has not been called to the case until this latter con-

dition has occurred, our object must be to press the tumor completely out of the pelvis, above the brim, making it an abdominal in place of a pelvic tumor.

If any difficulty be experienced in accomplishing this, it will be better to wait until shortly after the next menstrual period, in the meantime making the patient rest up in the recumbent position, lying in the semi-prone or even in the genu-pectoral position from time to time. Ergot should be administered, and if necessary the congestion still further lessened by the application of a few leeches to the cervix, or by scarification. A few days after the menstrual period, the patient being placed either in the genu-pectoral or the semi-prone position (the bowels having been well relieved and the bladder emptied), one or two fingers of the left hand are inserted *per vaginam*, and steady but gentle pressure made upon the tumor.

The direction of the pressure should be somewhat lateral, so that the tumor may partly rotate on its axis, and thus elude the sacral promontory. The force employed must be gently graduated to the resistance encountered. Unless the patient be extremely nervous or the tumor very sensitive, it will not be necessary to produce anæsthesia. It is an advantage having the patient conscious, as she will be able to guide us as to the amount of force that it may be prudent to adopt. Steady, firm, continuous pressure is more likely to accomplish the object in view than any sudden or severe force. If the resistance be very great, the uterine repositor may be employed, the spiral wire-spring being placed on the chest of the operator, who can thus keep up a continuous pressure without fatigue.

The patient should be kept quiet in bed for some few days afterwards, an opiate given if much pain or inconvenience has been caused, and the diet limited. The bowels must be carefully regulated for some time afterwards, so that no prolonged constipation or violent expulsive efforts risk the return of the tumor into the pelvis again. An elastic abdominal belt may be worn with advantage subsequently to relieve the pelvic viscera from pressure.

To promote absorption and to restrain the growth of fibroid tumors, in addition to what has already been advised, certain drugs have from time to time been recommended. Bromine and iodine waters, administered internally and employed as baths, are supposed to have been efficacious in this respect. Kreuznach and Woodhall spa waters are held in repute for this reason.

Bromide and iodide of potassium are also useful. Chloride of ammonium in combination with ergot has been highly spoken of. Borax, cannabis indica, digitalis, and other drugs have also been employed with the object of lessening the flux of blood to the reproductive organs. Chloride of calcium was formerly much relied upon as bringing about calcareous degeneration of the arteries, and so interfering with the nutrition of the tumors, but its action cannot be limited to the uterine arteries, and hence the danger of producing an atheromatous condition of the arteries generally.

Acupuncture and electricity have been suggested as likely to influence the growth of fibroids.

The subcutaneous injection of ergot or sclerotic acid is probably the most reliable method of restraining the growth of fibroids.

The fallacies which weaken any conclusion as to the influence of remedies in arresting the growth of fibroid tumors have been thus summarized by Dr. Barnes:

1. These tumors are often of extremely slow growth, so that any change in size, within even a considerable time, would be difficult to appreciate, and still more to prove.

2. Many of these tumors, when they have reached a certain size, exhibit no tendency to increase, but remain stationary, although no treatment is employed.

3. In a large number of instances there is a natural tendency towards inertness, or even retrogression, after the climacteric; and since these tumors frequently do not come under treatment until this period is approaching, such treatment may be merely coincident with the natural process of cure, not conducive to it.

4. The diminution in size may be apparent rather than real, being simply due to the absorption of serous infiltration.

And lastly, the most persistent use of remedies in many cases has not been followed by any sensible alteration in the hands of many competent observers.

Surgical Treatment of Fibroids.—Medicine having failed to check hæmorrhage, arrest growth, or induce absorption, and the other measures already described having failed to relieve the patient, we have next to consider the various methods suggested for the entire removal of the tumor, the so-called radical or curative treatment.

The mode of procedure will vary, depending upon the situation and size of the tumor.

The time selected for operation should never be immediately after a profuse hæmorrhage, but when the patient has had time to rally from its effects.

Whatever method be adopted it will be necessary to procure as free dilatation of the cervix as possible. This may be accomplished either by dilatation with sponge or laminaria tents gradually, or by preparatory dilatation with tents and incision at the time of operation. In some instances it may be found expedient to increase the amount of dilatation by means of Molesworth dilator or Barnes's bags.

Various methods have been suggested and practised.

Ecrasement, either with the chain or wire écraseur, or with the galvano-cautery.

Avulsion, by traction and rotation.

Excision, by the knife, scissors, or other cutting instruments.

Enucleation, either immediate or gradual, by incision of the capsule and manipulation.

Igneous Hysterotomy, perforating the growth with the actual cautery so as to produce necrosis and expulsion.

Hysterectomy, *Hysterotomy*, or *Gastrotomy*, removing the uterus and tumors together by abdominal incision.

Ecrasement.—Should the tumor project sufficiently from the

uterine wall, or be pedunculated, assuming a polypoid form, so that a loop of wire can be made to rest beyond the equator, or greatest diameter of the tumor, an attempt may be made to remove it by means of the galvanic écraseur.

The ordinary single wire écraseur is not sufficiently strong to cut through the base of attachment, if this be large and dense, as often happens, and should not therefore be relied upon.

If the case be not an urgent one, it may be well to induce the uterus to contract and still further expel the tumor from its bed by means of ergot, quinine, strychnia, or galvanism, before proceeding to attempt its removal, taking care that the cervix is first divided so as to facilitate expulsion.

It is not absolutely necessary to remove the whole of the tumor; if this be pedunculated, the portion left will soon shrink and disappear, or if more extensive, the wire, as it becomes tightened, may slip over the convexity of the tumor and thus cause its complete enucleation. If this cannot be effected we must remove as much as possible with the écraseur, and deal with the remaining portion as may subsequently be determined. When the tumor is firmly and extensively attached to the uterus, we must be careful not to exert too great traction upon the tumor in applying the écraseur, as partial or complete inversion may occur, and a portion of the uterus be thus included as the wire is gradually tightened. Cases of this nature have been recorded where the result proved fatal.

To apply the écraseur, the patient lying in the lithotomy, left lateral, or semi-prone position, the cervix having been previously well dilated, the wire loop is compressed in an elongated form and passed into the uterine cavity. When released from pressure the loop expands again into an oval or circular shape, and is then passed up over the tumor, the stem of the instrument being pressed upwards towards the base, the loop being guided by the finger or by means of a long crutch-shaped wire. The loop is now gradually tightened and the base cut through. The tumor is then removed by the finger, ovum forceps, or vulsellum. There is seldom any hæmorrhage, but if necessary the actual cautery, perchloride of iron, or other styptic may be employed, or the uterus be packed with strips of lint soaked in a saturated solution of alum.

If the galvanic écraseur be employed, care must be taken to ensure sufficient battery power to heat a loop of sufficient size while passing through moist tissues.

In some cases we may be called upon to operate when the tumor has already been partially extruded into the vagina, interfering with the functions of the bladder and rectum, and even producing symptoms analogous to those observed during parturition when the foetal head becomes impacted in the pelvis.

It may be impossible to pass the finger sufficiently far up to ascertain the dimensions of the base, or to feel the os uteri. We must be careful, therefore, not to mistake the tumor for an inverted uterus by detecting the fundus behind the pelvis, by the relatively greater size, and by the less sensitive condition of the surface.

In such a case we must pass the loop of the galvanic *écraseur* up as far as possible to the base of the tumor, either by using the separable tubes of the galvanic *écraseur* like Gooch's canulæ, or by carrying the wire up by the aid of two gum-elastic catheters suitably curved. These being passed up posteriorly, one is passed round on either side to the front, and the stem of the *écraseur* passed over them. The ends of the wire being then fastened, the stylets of the catheters are withdrawn and the battery set in action. The wire when heated thus cuts through the catheters and tumor together, this latter being then removed by aid of forceps or other appropriate means.

Fig. 117.



Sims's Guarded
Tumor Hook.

Where this plan fails, the tumor may either be removed in successive portions by means of the *écraseur* or by scissors.

Avulsion succeeds in some cases where the tumor projects sufficiently from the uterine wall. Seizing the tumor with a pair of vulsellum forceps traction is exerted, and a slight rotatory movement given to the instrument. If the attachments be not too firm the tumor may thus be brought away. In some cases it may be well to combine the use of the *écraseur*, the wire loop being slipped up over the vulsellum, and tightened so as to cut through the capsule as near the wall of the uterus as possible. By alternate twisting and traction the fibroid is thus wrenched from its bed and at length removed. This method is only applicable to submucous fibroids.

Sims's Guarded Tumor Hook (Fig. 117) is sometimes of service in these cases. The vulcanite guard can be slipped forward when the instrument is to be introduced, and withdrawn when the hooks are on the surface of the tumor.

Excision by the aid of knife or scissors is not often practised, owing to the risk of hæmorrhage. It may, however, be resorted to in cases of small submucous fibroids projecting into the uterine cavity, more especially when they are situated low down in the cervix, a thing of rare occurrence.

Aveling's polyp tome (Fig. 114) answers well when the growth is attached high up.

Enucleation is an operation that should never be rashly undertaken. The risks to life are very great. Hæmorrhage, exhaustion, perforation of the uterus, peritonitis, pyæmia, and pelvic cellulitis are the consequences most to be dreaded. Unfortunately, the operation being regarded as not only a difficult but also a dangerous one, it is not resorted to until the patient is often exhausted by profuse and protracted hæmorrhages and worn out with prolonged suffering. Where ordinary palliative measures have been tried and failed, and the situation of the tumor

is such that its removal is possible, the practitioner should not be deterred from resorting to this operation until the vital powers have become so enfeebled as to preclude all hope of recovery, but should give the patient the option of having it performed while there is still hope of rallying. Under no circumstances should the operation be attempted unless it is pretty certain that there is a sufficient thickness of uterine tissue covering the tumor to preclude all risk of opening into the peritoneal cavity; neither should it be resorted to in the case of large tumors whose texture is continuous with the uterine wall. It is for the encapsuled hard fibroids, that show a tendency to become extruded from the muscular wall, or even from the cavity of the uterus, that the operation of enucleation is specially applicable. Whenever practicable, the immediate method, by which the tumor is enucleated at one sitting, should always be employed, as it is attended by far less risk of evil consequences in the way of septicæmia, etc., than if the more gradual method be adopted, in which the fingers of the operator merely inaugurate the process, the uterus being excited to contract and expel the tumor subsequently.

To perform immediate enucleation it is necessary to have the vagina previously well dilated by means of Barnes's bags, as also the cervix. The patient being then placed in the lithotomy position, and anæsthesia produced, an assistant steadies the uterus by pressure over the abdomen. The operator then incises the capsule of the tumor, either by means of a probe-pointed bistoury with a long handle, or by long-handled scissors, a crucial incision being made to facilitate expulsion. The fingers are then inserted, and the tumor separated from its capsule. Strong vulsellum forceps should then be applied, and a firm hold secured, so as to drag the tumor well forward. Its base of attachment is then separated by the aid of the fingers, or of an instrument specially constructed for this purpose, in the form of a curved, blunt spatula with roughened edges, and the tumor thus enucleated or shelled out. The hæmorrhage induced is seldom urgent, but, if thought requisite, the surface may be swabbed over with the liquor ferri perchlor. or other powerful styptic.

If for any reason it be deemed prudent not to persevere with the operation, having made a crucial incision in the capsule and separated this as far as practicable, the patient is then put to bed, and the steady, systematic employment of ergot persisted in, so as to promote the gradual or spontaneous enucleation of the tumor. When this has advanced to a certain stage, or the vitality of the tumor is impaired, it may be well to expedite matters by the process of avulsion, the tumor being seized by the vulsellum, and traction with rotation made upon it, so as to drag it away from its bed. Should the tumor be so large as to be incapable of being extracted entire through the pelvis, we may still succeed in removing it by making a series of spiral or oblique incisions into its substance. Firm pressure being made above the pubes, and traction exerted by means of a strong vulsellum, the tumor elongates. Fresh in-

cisions are then made higher up, until the whole mass is extracted. The same result may be secured by removing wedge-shaped pieces, and so extracting the tumor piecemeal, either by tearing or cutting it away, or by the aid of the *écraseur*.

Having removed the tumor, the cavity should be washed out with hot water injected into it, this being a prompt exciter of uterine action. Contraction may be increased or maintained, and all risk of further hæmorrhage obviated by the application of the strong tincture of iodine, which is also a most valuable antiseptic. The cavity may then be stuffed with cotton saturated with glycerin, or with a strong solution of alum, which is allowed to remain in for the first day or two, depending upon circumstances, when all further dressing may be dispensed with, some disinfectant solution, such as iodine, carbolic acid (1 in 40), or permanganate of potash being employed as long as any discharge continues, or until the cavity has become filled.

Igneous Hysterotomy is the term suggested by Dr. Barnes for the operation of boring a hole in the tumor by means of the actual benzoline, or galvano-cautery, so as to induce a process of sloughing or necrosis, followed by a spontaneous enucleation of the tumor through the artificial aperture. The risk of septicæmia occurring is supposed to be less than in the case of cutting or tearing. This method is proposed for cases where the tumor is low down in the cervix, or where the growth develops in the posterior wall of the uterus, the cervix being carried high up behind the pubes, so that it is found impossible to get at this for the purpose of dilatation. In this latter case the cautery is thrust through the posterior vaginal wall into the fibroid tumor itself.

Spaying, or Normal Ovariectomy, has of late been frequently resorted to in cases where the hæmorrhage is so severe as to threaten life, and the time of the menopause is yet far distant. Extirpation of the ovaries by removing the ovarian stimulus lessens the periodical congestions of the uterus and induces artificially the menopause, thus abating hæmorrhage, arresting growth of the tumor and tending to promote the retrogression of it as well.

Goodell considers that when vaginal enucleation is impossible and the question is reduced to one of three, viz., spaying, enucleation by gastrotomy, or the extirpation of the invaded womb, there is but one answer, and that one in favor of spaying, the operation being a less serious one than either successful or unsuccessful attempts at enucleation.

Spaying is more especially indicated when, the tumor being interstitial, removal through the vagina cannot be effected without incurring too great risk, and the hæmorrhage is so severe as to seriously endanger life. Even when periodical hæmorrhages from the uterus occur after removal of the ovaries, it is far more amenable to the influence of cold, styptics, and other remedies than before, and there is less risk of any evil effects ensuing in consequence of arresting menstruation.

The operation may be performed either through the vagina or

by means of an abdominal incision. The vaginal method has the advantage of exposing the peritoneum less, but is not always applicable, as in cases where the ovaries are carried up by a large tumor and lie beyond the reach of the finger, or where strong pelvic adhesions exist.

If this method be adopted the patient should be placed in the lithotomy position, the vagina cleansed with carbolized water, a duckbill speculum introduced, and the perineum pulled downwards. A tenaculum is then inserted in the posterior cul-de-sac of the vagina and an opening an inch long made into the peritoneal cavity by snipping through with a pair of scissors. The index-finger of the left hand is then introduced, the womb pressed down by the right hand externally, and the ovary hooked down. It is then seized by a fenestrated forceps and brought into the vagina. A needle armed with a double thread is now passed through the pedicle and each half securely tied. The ovary is then removed, the ligatures cut short, and the stump returned into the pelvic cavity. The other ovary is then dealt with in like manner.

If the abdominal operation be performed, antiseptic precautions must be adopted. An incision extending from the umbilicus towards the pubes is made in the mesian line, and one ovary drawn up into the opening by two fingers. The mesovarium is transfixed by a needle carrying a double carbolized silk ligature, the two halves are securely tied, the ovary removed, the ligatures cut short, and the pedicle returned into the abdomen. The same steps are pursued with the other ovary, and the wound is then closed. The risks appear to be less than in case of spaying, where the ovaries are adherent and degenerated.

Where doubt as to the exact nature of the case exists, or what kind of operation will be most advisable, an exploratory incision should be made and the question decided according to circumstances, whether the ovaries alone, the tumor with a portion of the uterus, or the entire uterus and ovaries as well, should be removed.

Subperitoneal fibroids are not amenable to surgical treatment, as with the interstitial and submucous varieties. Removal by gastrotomy is the only method at our disposal. Fortunately, they comparatively seldom give rise to so much inconvenience as to necessitate operative interference. But where their presence so interferes with the patient's comfort, whether by pressure upon the pelvic or abdominal organs, as to incapacitate her from performing the duties of her station, or the symptoms are such as to threaten life, we are then perfectly justified in resorting to any operation that offers a reasonable prospect of success.

The great difficulty, as a rule, is in estimating beforehand the extent of attachment to the uterus. If the pedicle be small and the amount of adhesions to neighboring structures be slight, the removal of a subperitoneal fibroid is not attended by greater risk than that incurred in an ordinary case of ovariectomy.

The operation is performed in a similar manner and with like

precautions. The pedicles are transfixed and tied firmly with carbolized silk.

Hysterectomy, or *Hysterotomy*, are the terms employed to designate the far more formidable operation of ablation or extirpation of the uterus, when enlarged by fibroid or fibro-cystic disease, by abdominal incision.

It should never be resorted to until other less dangerous methods have been fairly tried and failed. It is more especially adapted to the fleshy and fibro-cystic kinds of tumors that are too large to admit of removal by the vagina, and yet are endangering life by uncontrollable hæmorrhage, (when the patient is yet many years from the climacteric,) by very rapid increase in size, or by pressure upon abdominal or pelvic organs, of such a kind as to render life no longer endurable.

Since the adoption of antiseptic precautions, and possibly also owing to the increased experience recently gained in abdominal surgery, the operation bids fair to become in time a recognized, practicable, and expedient procedure.

M. Pean, who strongly advocates this operation, regards it as not of much graver character than extirpation of ovarian cysts complicated by adhesions.

The increased risk is mainly due to the bulk and vascularity of the pedicle, which is formed by the cervix and broad ligaments. The accidents which have thus far contributed most to a fatal termination have been the shock or collapse, owing to the lengthened period often occupied in performing the operation, primary or secondary hæmorrhage, peritonitis, and septicæmia.

It is essential that the lower portion of the cervix should be free and not involved in the tumor, as this constitutes the stump. The danger of the operation would be increased if the cervix had to be removed, owing to its relations with the bladder.

The operation should be conducted with the same precautions both as to preliminary preparation and minor details as in the case of ovariectomy.

The week following the menstrual period, unless this has been very profuse, should be chosen. As it is impossible always to predict the exact nature of the operation we may be called upon to perform, it will be well to have sufficient skilled assistance at hand, the same instruments as used in ovariectomy, and in addition several powerful *serre-neuds*.

The abdominal incision will generally need to be somewhat longer than for ovariectomy, taking care to avoid wounding the bladder. Having exposed the tumor, the hand should be passed low down into the pelvis so as to explore the attachments and ascertain the presence or absence of adhesions. If possible the tumor should then be pulled well forwards and upwards, the broad ligaments on either side being transfixed and tied in two or more sections, below the ovaries, with carbolized silk. A strong curved needle is then passed through the cervix uteri, and a double strong wire drawn back through the opening. Each half is tightened and

held fast by Cintrat's serre-nœud, an instrument like a short écraseur, taking care that the loops of the wire interlace. Or, what is possibly better, in place of wire, whipcord or stout carbolized silk may be used to ligature the cervix, the ends being cut short, and the stump returned into the abdomen, the wound being then closed.

Should the tumor at first be too large to permit of its being withdrawn from the abdomen, it may be necessary to perforate the tumor by several metallic wires, and tighten separate sections by means of the serre-nœud, the part above the wire being then cut away; "morcellement" as it has been termed.

If it be found impossible to secure a healthy portion of cervix to form a stump, it may be necessary to extirpate the uterus entire by Freund's operation, as described when speaking of cancer.

The success of the operation hitherto has not been such as to justify a resort to it unless the life of the patient is unmistakably threatened. Dr. Barnes considers that the justification for attempting enucleation, avulsion, or other mode of removing large fibroid tumors, will rest upon: 1. Uncontrollable hæmorrhages endangering life; 2. Signs of sloughing or decomposition of the tumor, with present or threatening peritonitis or pyæmia; 3. Dangerous pressure upon the bladder and rectum; 4. Such great size as to cause dangerous pressure upon the abdominal and thoracic viscera.

Fibro-cystic Tumors of the Uterus; Cysto-fibromata.—These are of comparatively rare occurrence, and are chiefly of interest in relation to the diagnosis of ovarian tumors. In place of the ordinary dense fibroid tumors of the uterus we occasionally notice tumors of a more or less soft, loose, fleshy character, clinically distinct from the former, affecting the body of the uterus chiefly, rarely multiple, not often encapsuled, attaining a large size, very vascular, the tissue becoming œdematous by infiltration with serum, giving the impression to the touch of being fluctuating or semi-solid. In the substance of these tumors cysts sometimes are formed, or rather large collections of fluid occur between the fibres, there being no cyst wall. In some cases no true fibroid element is met with in the tumor, there being merely a cyst in continuity with the uterus, whose thick vascular wall is formed of non-striated muscular fibres and connective tissue. Paget considers that the cyst formation may be due to a local softening and liquefaction of part of the tumor, with effusion of fluid in the affected part, or to an accumulation of fluid in the interspaces of the intersecting bands.

Hæmorrhages into the substance of the tumor may lead to the formation of cavities similar to the so-called apoplectic cysts. A localized inflammatory process giving rise to the production of serum or pus may produce a cavity. Progressive dilatation of lymphatic vessels may give rise to cavities, which contain a limpid, yellow, fibrinous-like lymph, spontaneously coagulable.

Symptoms.—These are similar to those we should expect to find in the case of a subperitoneal fibroid about the same size: more or less displacement of the uterus, pressure upon the pelvic and abdominal organs, and in some cases menorrhagia.

Physical Signs.—On palpation an obscurely fluctuating sensation is discovered, different from the hard, solid, resisting feel of a fibroid, or the more uniformly soft fluctuating character of an ovarian cyst.

Differentiation.—This in many cases is extremely difficult. The three conditions most likely to be confounded with fibro-cystic disease of the uterus are pregnancy, fibroid tumors of the uterus, and ovarian cyst.

In cases of pregnancy, the mammary signs, minor symptoms, cessation of the catamenia, detection of the foetal movements and heart-sounds, and the duration of the growth, will generally guard us from error; the former being absent in fibro-cystic disease, and the duration of the tumor being more than nine months.

From fibroid tumor it may be recognized by not being so dense, yielding evidence of obscure fluctuation, its larger size, more rapid growth, and by its yielding fluid when tapped.

From ovarian cyst it is often impossible to decide. The history of menorrhagia, the development of the tumor in the centre of the lower part of the abdomen, the slow but steady growth of the tumor, extending it may be over four or five years without impairing materially the general health, the fact that the uterine sound enters beyond the normal distance, and that the uterus moves with the tumor and seems to be a part of it, will suggest the probability of the tumor being fibro-cystic and not ovarian. If now the aspirator or fine trocar be employed and the fluid examined, we shall notice that in case of fibro-cystic disease the fluid is generally clear, limpid, yellowish, coagulating spontaneously and also with heat; the coagulum shrinking and separating into a clot and thin watery serum on standing. The fluid contains albumen but not paralbumen, and when examined under the microscope leucocytes or spindle-cells are seen, but not the granular cells of ovarian fluid.

After withdrawal of the fluid it will be found that the sac has only partly collapsed, some solid matter remaining. Should any doubt still exist, and the symptoms be sufficiently urgent to justify interference, an exploratory incision may be made. Nothing is more characteristic than the dark and congested appearance of a fibro-cystic tumor of the uterus, so strongly in contrast with the light, clear, pearl-like hue of most ovarian cysts.

Progress.—Fibro-cystic disease of the uterus, as a rule, grows more rapidly than a simple fibroid, but develops more slowly than an ovarian cyst. It may exist for a number of years without causing any serious impairment of health, unless it exercises pressure upon important organs, or by its excessive bulk prevents the patient taking out-door exercise.

Treatment.—The remarks made in reference to the treatment of large fibroids apply here. It will be needless to repeat them.

CHAPTER XVII.

CANCER OF THE UTERUS.

Cancer of the Cervix Uteri.—*Definition.*—The term cancer is applied to “new formations consisting of cells of an epithelial type, without any intercellular substance, grouped together irregularly within the alveoli of a more or less dense fibroid stroma” (Green). Clinically they are spoken of as malignant, in that they tend to destroy the organ primarily attacked, to spread by contiguity into the surrounding tissues, to infect the glands and other organs, to return after removal, and by infecting the system to cause death.

Frequency.—Cancer of the uterus is of frequent occurrence. In England alone the annual mortality from cancer exceeds 10,000, of whom over two-thirds are females. As the uterus is more commonly affected than any other organ in the female, it will be thus seen that the number of cases succumbing to this terrible malady is considerable.

The majority of the cases occur between the ages of forty and fifty, although instances have been reported of mere infants being affected with rapidly developing carcinoma, proving fatal, and young girls of all ages have succumbed to it.

Rokitansky thus states the preference of cancer for various organs. First the uterus, the female breast, the stomach, the large intestines, and especially the rectum, then the lymphatic glands, etc.

Causation.—Cancer of the uterus, although met with in single and sterile women, is far more frequent in those who have borne many children. Functional activity of the organ may thus be regarded as an important element in the production of cancer. Injuries inflicted on the cervix during parturition, inflammatory conditions resulting from these, granular degeneration of the cervical mucous membrane, and irritation from mechanical causes, will also explain the tendency to malignant degeneration, more especially if there be any hereditary predisposition to the malady in multiparæ.

Opinion is pretty equally divided between those who regard the malady as a local manifestation of constitutional origin, and those who regard it as a disease originally of local origin, rapidly infecting the system. Against the theory of local origin, hereditary tendency, although it may be difficult to establish this even in a majority of cases, must be cited. Another fact strongly insisted upon by Dr. Barnes is “the almost constant tendency to a fatal termination from the moment when we have an undoubted diagnosis. This means that it is rarely indeed possible to find the disease in its presumed strictly local initiative condition. From its earliest discovery it has already effected a strong hold upon the constitution.”

Emmet regards epithelial cancer as frequently arising from perverted nutrition in the attempt to repair injury. He has never known a woman to have any form of epithelial cancer of the uterus unless she had at some time been impregnated, and believes that nearly all, if not all, cases of epithelioma, or cauliflower growth, have their exciting cause or origin in a laceration of the cervix.

Varieties.—The *encephaloid*, *medullary*, or *acute cancer* is by far the most frequent form met with in the uterus. Next in order comes *epithelioma*, or *epithelial cancer*; and last and least frequently, indeed very rarely, *scirrhus*, *fibrous*, or *chronic cancer*.

In thus speaking of different varieties, it must not be imagined that they are at all times separate and distinct. The encephaloid carcinoma differs merely from the scirrhus form in the greater rapidity of its growth, and the consequent small amount of its stroma, and the softness of its consistence. They cannot be regarded as in any way constituting distinct varieties of cancer. These are all intermediate stages between them. The physical aspects of the varieties of cancer depend merely upon varying proportions and anatomical arrangement of their component parts.

Pathological Anatomy.—**Encephaloid, or Medullary Carcinoma**, is characterized by the very small proportion of stroma and the abundant growth of epithelial cells. It is more or less of a soft, brain-like consistence, and lobulated. The central portions often being completely diffuent, owing to fatty degeneration, and the blood-vessels being very numerous, hæmorrhage readily occurs.

The cells are for the most part larger than in scirrhus, and quickly undergo fatty degeneration, so that often more free nuclei than cells are visible.

The dissemination of encephaloid takes place much more rapidly than that of scirrhus, owing to the greater rapidity of its growth, its greater vascularity, and the greater activity of its epithelial elements.

One form of this variety is sometimes spoken of as cauliflower excrescence, though this latter term is generally applied to epithelioma.

Epithelioma, or Epithelial Cancer, is distinguished by excessive proliferation of the squamous epithelium. As this increases it becomes *heterologous*, extending beyond the normal limits into the subjacent connective tissue.

As the cells increase in number they tend to become arranged concentrically in groups so as to form globular masses, the *concentric globules*, or *epithelial nests*, which, although not distinctive, are exceedingly characteristic of epithelioma.

The stroma may be tolerably abundant, or almost entirely wanting, presenting every variation between rapidly growing embryonic and an incompletely fibrillated tissue.

Epithelioma is much the least malignant of all the cancers. It extends locally, and may infect the neighboring lymphatics, but it comparatively rarely reproduces itself in internal organs.

Epithelioma of the cervix, contrary to what usually occurs when the skin itself is affected, often merges into carcinoma as it advances, and does not remain true to its original character.

Galabin has recently shown that the histological characters of those growths, which are generally clinically regarded as epithelioma, are very variable. Epithelioma is apt to merge into carcinoma, as soon as either the epithelial masses no longer simply increase by their own growth, but begin, by a kind of spermatie influence, to stimulate the nuclei of the adjacent stroma to grow also into epithelioid cells, or else the epithelial cells or their nuclei migrate along the lymphatic tracts into the cellular tissue. Hence there are many cases which it is not easy positively to classify either as epithelioma or carcinoma.

It is only exceptionally that the bird's-nest bodies, or epithelial globes, whose presence proves the growth to have originated from squamous epithelium, are seen. Even when they are present it is only just at the edge of the ulcerated surface that it is possible to trace any ingrowth of processes from the surface epithelium, and the cancer generally spreads for some distance beneath normal or merely thickened epithelium.

The epithelial masses nearest the healthy surface generally consist of cells resembling those of the squamous epithelium, bounded by a regular margin of columnar-like cells, sharply demarcated from the surrounding stroma. The cells are also cemented together like those of the squamous epithelium, either by the delicate processes uniting cell to cell, and constituting the so-called "cog-wheel" cells, or apparently by adhesion of the whole cell-walls. In older portions or deeper parts of the same growth the cell-masses may be seen without any border of regular cells, and no longer demarcated clearly from the stroma.

In more numerous cases no epithelial globes are seen, but the large masses of cemented cells, often with regular borders, render it probable that these also commenced from squamous epithelium, and sometimes their continuity with it can be traced. It is not uncommon to see the cell-masses elongated into the form of more or less parallel columns, having borders of regular cells, and separated by narrow bands of stroma.

In other parts of the growth may be seen an approximation towards the characters of carcinoma. Sometimes the cells become elongated into a long spindle-shape either at right angles to, or parallel with, the axis of the cell-columns. In the more rapidly growing forms of tumor the cells deviate in another manner from the characters of squamous epithelium, and not only cease to be cemented, but show proliferating nuclei and become very various in shape and size.

In a small number of cases he has found evidence of the commencement of the growth by the degeneration of mucous glands. The epithelium of the glands proliferates, so as more or less completely to fill up the acini. In this way the alveolar arrangement of true carcinoma is at once reached. Eventually the cellular tis-

sue is infected by the growth in it of similar cells, or migration of cells from the primary alveoli.

In a small number of cases the structure is that of sarcoma, or lympho-sarcoma, originating in the cellular tissue.

Epithelioma of the cervix in some rare instances shows a strong tendency to ulceration, and has been described under the terms *rodent*, or *corroding ulcer*, or *canceroid* of the uterus. Rapid destruction of tissue takes place. There is a complete absence of any induration or infiltration, and although profuse hæmorrhages may result as the ulcerative process extends, and death from exhaustion or from peritonitis occur, still the progress of the disease is often very slow, and may extend over many years before a fatal termination ensues.

But few well-authenticated cases have been observed of late, and it is a question whether this variety merits a separate pathological nomenclature.

Vegetating Epithelioma, or Cauliflower Excrescence, are the terms employed to designate a sprouting form of papillary growth from the cervix, characterized by an extraordinary development of cervical villi and proliferation of the cells which cover them. Rokitsky speaks of it as villous cancer, and describes it as a conserva-like growth developed out of an encephaloid. Virchow regards the excrescence as at first a simple papillary tumor, which subsequently passes into a canceroid state, but not into cancerous papillary tumor. Thomas says, "these tumors, commencing as papillary hypertrophies on the cervix or os, are at first local, but in time affect the constitution. They are sometimes engrafted upon true cancerous deposit in the cervical parenchyma." The tendency to involve the adjacent tissues is far less than in ordinary cancer, the morbid action is at first limited entirely to the cervix, and it is at this stage that amputation of the vaginal portion is often successful in removing the disease. On examination the growth is found to consist of lobules, each separate papilla containing a central loop of blood-vessels supported by delicate areolar tissue, their substance consisting mainly of round cells, those on the surface being flattened.

Scirrhus, fibrous or chronic cancer, is characterized by the large amount of its stroma and the small amount of its cells, which are most abundant in the external portions of the tumor where growth is taking place.

Owing to the excessive growth of the stroma and its subsequent induration and contraction, obstruction and obliteration of the blood-vessels result, thus limiting the vascular supply and checking the epithelial generation, so that growth of the tumor is often very slow.

Symptoms.—Hæmorrhage, especially on sexual intercourse, is often the first symptom directing the patient's attention to the fact that anything is amiss, and even then it may be found that the disease has made considerable progress.

In cases where the menopause has not yet arrived, the catamenial periods are often profuse, or the hæmorrhage may recur at irregular intervals without any apparent cause, or upon any extra exertion or

fatigue. Where the climacteric age has been reached, and uterine hæmorrhage recurs after a long interval, the possibility of cancer being present should always be suspected, and a local investigation made.

Hæmorrhage, as a rule, occurs earlier in those cases where the disease assumes the vegetating form.

Pain, so long as the disease is limited to the cervix, is seldom complained of, and is by no means so frequent or severe as generally supposed until the disease has advanced to the latter stage and the adjacent tissues have become infiltrated.

The pain is usually spoken of as shooting, stabbing, or lancinating in character, radiating from the centre of the pelvis to the lower portion of the back and groins, extending down the inner sides of the thighs and not infrequently to the loins.

It is generally worse at night, preventing sleep, thus differing materially from the pain attending chronic inflammation, etc., of the uterus, which is usually aggravated by standing or walking, and is relieved when the patient assumes the recumbent position.

In the latter stages of the disease the pain is often agonizing and persistent, effectually precluding sleep and rendering the patient's existence most deplorable. The pain is often aggravated on locomotion or on sitting down.

Vaginal discharge, at first of a watery character and free from any well-marked offensive odor, generally alternates with menorrhagia. As the disease progresses and the ulcerative stage is reached, this watery discharge is often tinged with blood, and acquires a most penetrating and offensive odor which clings persistently to the patient's linen, rendering her an object of disgust both to herself as well as to those who are brought into contact with her. It soon assumes an ichorous character, excoriating the vulva and surrounding parts, producing most troublesome erythema and irritation. Later on, when disintegration of the cancerous mass commences, the discharge becomes grumous, mixed with blood and putrilage, and not infrequently with urine from extension of the ulceration to the bladder. Shreds of gangrenous tissue, decomposing blood-clots, and occasionally portions of the diseased mass, are not infrequently expelled.

The *Cancerous cachexia* is generally well-marked in the latter stages of the disease, and is due to the repeated or constant hæmorrhages as well as to the exhausting serous discharge, and probably also to some septic absorption. The blood-globules rapidly diminish in number with the continuance of the hæmorrhage, and also become destroyed under the influence of the malignant toxæmia; the watery constituents of the blood are thus proportionately increased while the albumen is diminished.

The cachexia is evidenced by a peculiar sallow, yellowish, or dirty straw-colored tint of skin, which is difficult to describe, but is very characteristic in advanced cases.

The nutrition of the body becomes seriously impaired, emaciation ensuing; the digestive functions are deranged, nausea and

vomiting often resulting from the disgusting fœtor of the discharges; the bowels become obstinately confined, often doubtless owing to the influence of the opium taken to allay the pain, or occasional attacks of diarrhœa, from reflex irritation, occur. In some instances the diseased process extends to the walls of the rectum, a fistulous opening resulting, with incontinence of fæces.

Bladder symptoms are often present, and in many instances constitute the earliest manifestation of the disease. Dysuria and reflex tenesmus are generally first noticed, with subsequent incontinence of urine from extension of the ulcerative process to the base or neck of the bladder, and the formation of a fistulous opening.

Physical Signs.—Owing to the insidious manner in which cancer of the cervix usually commences, attention is not often directed to the uterus until the disease has made considerable progress, ulceration having commenced, with the characteristic symptoms of menorrhagia, and offensive watery or ichorous discharge.

The diseased process almost invariably begins at the external os, spreading gradually to the deeper tissues of the cervix and upwards in the course of the cervical canal.

If for any reason an examination be made at this stage, the cervix is generally found to be increased in bulk, indurated, its surface irregular or nodulated, the os puckered. The uterus itself is still mobile, unless fixed by previous inflammatory mischief. There is little or no tenderness on manipulation, though hæmorrhage is readily excited. The cervix feels hard like wet india-rubber, the mucous membrane covering it giving the sensation as if it were fixed to the subjacent tissues, not gliding over them as in a state of health. The margin of the os uteri is more sharply defined than normal, giving the impression to the finger that the cervix is more friable than in health. In some instances the cervix becomes hypertrophied, and assumes the form of a mushroom, the lower portion spreading out whilst the cervix above retains its normal size.

When the ulcerative stage has set in, the diagnosis is comparatively easy. In place of the smooth, healthy cervix, the finger detects a deep and ragged ulcer, with hard, unyielding edges, bleeding readily on touch; the surface is rough and friable, crumbling away if scraped with the finger-nail, and giving rise to profuse hæmorrhage. In the more advanced stages this condition has been described as *cancer crater*.

The morbid process has by this time extended up the cervical canal as well as to the vagina and surrounding tissues, which become infiltrated with the malignant deposit, thus fixing the uterus in the pelvis.

If a small portion of this friable mass be examined microscopically, we shall find it to consist of cells closely resembling epithelium, but varying considerably in outline, round, oval, fusiform, caudate, or polygonal. These cells are grouped together irregularly within the alveoli of a fibrous stroma, without any intercellular substance, and are characterized by their large size and by the magnitude and prominence of their nuclei, which are round

or oval in shape, and contain one or more bright nucleoli. There is no *specific* cancer-cell. It is the general character of the cells, together with their mode of distribution in the meshes of a fibroid stroma, that determines the nature of the growth to which they belong. (Green.)

Differentiation.—In the very early stage, the diagnosis of cancer of the cervix is extremely difficult. The main points to be relied upon are the readiness with which hæmorrhage occurs on the slightest touch; the induration, hypertrophy, irregular or nodulated surface of the cervix; the fixidity or immobility of the mucous membrane, and the unyielding nature of the cervix under the influence of sponge tents.

The induration due to areolar hyperplasia has more feeling of elasticity than is found in cancer, and under the influence of a sponge tent the cervix becomes dilated and softened. There is usually a history of long-standing uterine disorder, menstruation being more scanty than profuse, the pain being increased during the menstrual flow in place of being relieved by hæmorrhage as in cancer.

Where hyperplastic induration of the cervix is combined with fibroid of the uterus, and the organ is impacted in the pelvis, it may be very difficult to differentiate this condition from cancerous infiltration, inasmuch as menorrhagia, immobility of the uterus and enlargement of the cervix are alike common to both conditions. The history of the case, duration of the symptoms, and progress of the growth, will generally enable us to decide the question.

Hypertrophy of the follicles of the os uteri from occlusion, when small nodular projections with a whitish translucent centre are found on the lower portion of the cervix, which is very congested, may give rise to a supposition of cancer. Puncture of the follicles, thereby allowing the mucous secretion to escape, the softness of the cervix, and absence of any constitutional symptoms, will generally prevent our mistaking the two conditions.

Syphilitic growths or ulcers are comparatively rare productions on the cervix uteri; still, the possibility of their occurrence should make us careful. The history of syphilis will generally be distinct. On examination the surface does not present the soft friable character usually met with in cancer, it does not bleed so readily on touch, and the discharge has not the penetrating odor so characteristic of cancer. The application of nitric acid, and the influence of constitutional treatment, if the case be syphilitic, will also tend to clear up the diagnosis. Examination of a small portion of the growth microscopically should never be neglected.

Syphilitic ulceration has been known to extend to the bladder and rectum, laying open these cavities, and producing a condition similar to that occurring in the latter stages of cancer.

When cancer of the cervix has progressed to the ulcerative stage, it is sometimes confounded with laceration of the cervix from parturition, eversion of the lips, and intense granular degeneration of

the exposed surface. In these latter cases, however, the cervix is generally softer even than normal, and hæmorrhage is far less likely to occur from digital exploration than it would be in cancer. The discharge met with in laceration of the cervix is usually more of a viscid muco-purulent character, free from any offensive odor as would in all probability be the case in cancer at such a stage. The duration of the symptoms, progress of the case, results of appropriate treatment and of microscopical examination, will also assist materially in clearing up the diagnosis. In cases of cancer, if the speculum be resorted to it must be passed with the greatest care, as otherwise profuse hæmorrhage may be induced. The normal contour of the cervix will be seen to be altered materially. It is enlarged, irregular in outline, the central portion eaten away, the surface being ulcerated and bleeding readily upon the least touch, whereas in cases of laceration of the cervix, although the cervix presents an intensely injected florid appearance, there is no ulceration or loss of tissue, but merely a granular degeneration of the mucous surface. This does not bleed anything like as readily as would be the case in cancer.

Fibrous polypus of the uterus that has been extruded from the cervix and grown after its descent into the vagina may simulate closely the appearance of cancer in the ulcerative stage. Instances have been recorded where adhesions between the polypus and contiguous portions of the vagina have taken place, preventing the passage of the examining finger, which encounters only a soft sloughing or ulcerated mass, bleeding readily on touch and giving rise to a more or less constant watery or sero-sanguineous discharge. Under these circumstances the case may easily be mistaken for one of cancer. The duration of the disease, extending over a longer period than would probably have been possible with cancer, the comparatively slight amount of pain, the absence of well-marked fœtor of the discharge, and the softer, less friable condition of the surface, should put us on our guard.

If, then, on careful examination, we can succeed in passing the sound or the end of the finger between the growth and the vaginal wall, tearing through any adhesions if necessary, so as to distinguish the cervix uteri beyond encircling the pedicle of the polypus, the diagnosis will be determined.

When a large fibrous polypus has descended into the vagina and its lower surface become irregular and sloughy, it may readily be mistaken for cancer. The absence of any depression in the centre corresponding to the os uteri, the fact of the finger being able to be passed between the growth and the vagina, so as to detect the cervix uteri beyond with its smooth rim, and the pedicle of the polypus emerging from it, will enable us to recognize the nature of the case.

When the disease has extended to the surrounding tissues, infiltrating them and fixing the uterus, cancer has been mistaken for pelvic cellulitis, but in this latter condition the history of the onset, generally following parturition, the detection of the deposit

around the uterus, and the absence of any ulceration of the cervix or foetid discharge, should prevent our making any mistake in the diagnosis.

Prognosis.—Where the diagnosis of the disease has not been made sufficiently early for operative interference to be of any lasting benefit, the prognosis is generally most unfavorable.

It is true that instances of spontaneous recovery from uterine cancer have been recorded upon unquestioned authority, the mass sloughing away, the surface healing over, and the patient recovering; but these cases are extremely rare, and such a contingency can scarcely be regarded as more than a bare possibility. The more general result is for the disease to terminate fatally within eighteen months to two years after recognition of its character. In some cases profuse hæmorrhage may cut short life within a few months; in other instances life may be prolonged for many years, the disease progressing very slowly.

The form of cancer will influence the prognosis as to the probable duration of the disease. Medullary carcinoma is the most acute of all cancers, and generally runs a very rapid course, whereas epithelioma progresses far more slowly, and is also not uniformly progressive, its course being apparently arrested for a time, leading the patient to infer that a cure has been effected.

The prognosis is also influenced by treatment. If the diseased mass can be removed, or the condition of the surface altered by means of various applications, so as to restrain hæmorrhage and check septic absorption, life may be materially prolonged.

Under any circumstances it is not advisable to tell a patient, perfectly unprepared it may be to receive so severe a sentence, that she is suffering from a hopelessly incurable form of cancer. There is always the possibility of an error in diagnosis and of relief by treatment, and we should hesitate to condemn a patient, already the subject of much physical suffering as well as mental anguish, to unmitigated despair. It is quite sufficient to guard oneself by pronouncing the case to be one of a serious nature and not readily amenable to treatment, or only susceptible of temporary benefit, at the same time holding out hopes of improvement, and promising that everything possible shall be done with a view to arrest the progress of the disease and allay suffering.

Terminations.—Spontaneous cure, by sloughing of the diseased mass, although extremely rare, is not impossible. It has been known to follow parturition. The usual mode of termination is by exhaustion from hæmorrhage associated with septicæmia from absorption of putrid fluid. The nutrition becomes seriously impaired, owing to the inability to take food, and in some cases actual starvation occurs. Uræmic convulsions from suppression of urine, in consequence of the retrograde impairment of the urinary apparatus leading to hydronephrosis, or from occlusion of the ureters, not infrequently produces a fatal termination.

Amyloid degeneration of the kidneys and liver is not uncommon. Venous thrombosis may give rise to phlegmasia dolens or to em-

bolism which terminates fatally. Extension of the disease to the peritoneum may set up peritonitis which proves fatal, or death may result more or less suddenly from shock due to perforation into the peritoneal cavity.

Contagiousness of Cancer.—The fact that husbands live with their wives long after the disease has been recognized, and that no authentic instance of the disease being propagated from one to the other has been recorded, goes far to disprove the theory of its being contagious. As Dr. Barnes suggests, possibly grafting on a raw surface is necessary, and probably the malignant cells will only retain their vitality in tissues of congenial morbidity.

Complication with pregnancy is by no means uncommon, and always increases the danger to life, inasmuch as the growth progresses more rapidly and hæmorrhage is often severe. If premature labor be induced artificially, there is great difficulty in getting the cervix dilated sufficiently to allow the fœtus to pass, and even if this be accomplished there is great risk of dangerous or even fatal violence being produced. The cervix has before now been amputated at the mid-period of pregnancy without interfering with the progress of this latter, which went on to full term.

Treatment.—If detected sufficiently early, before infiltration has taken place into the surrounding tissues, when the morbid process is wholly confined to the cervix, the expediency of operative interference should at once be considered. If the physical signs be sufficient to warrant the supposition of cancer, in place of waiting to see whether the disease progresses, a second opinion should at once be suggested, so that no delay whatever may occur, for it is only in the very early stage, when the uterus is still mobile, that operative measures are at all likely to be of service. Even though recurrence of the malady should take place after operation, the course of the disease will be protracted, the patient's life prolonged, and much suffering averted, if only proper care be taken in effecting as complete a removal as possible of all diseased tissue. If the case be one of epithelioma or cauliflower excrescence of the cervix, or medullary cancer assuming the mushroom form, where the mass is circumscribed, where a distinct neck of normal tissue can be felt above the diseased mass, where the uterus is mobile and there is no evidence of glandular or constitutional infection, removal by means of amputation of the cervix should certainly be performed.

Amputation of the cervix may most readily and with the greatest amount of safety be performed by means of the galvano-cautery. The danger of drawing in a portion of the vaginal cul-de-sac, the risk of hæmorrhage, and the fear of septic absorption are thus materially lessened.

In order to allay nervousness and prevent the patient moving whilst adjusting the wire, it is generally better to give the patient an anæsthetic. Placing her then either in the left lateral, semi-prone, or in the lithotomy position, the diseased mass is seized with a vulsellum and the cervix thus held firm, little or no traction being

employed. The cold wire loop is then passed over the handle of the vulsellum and adjusted, by aid of the finger, round the cervix, the loop being gradually tightened until it becomes somewhat imbedded in the tissue of the cervix. The current of electricity is then passed through the wire, which is thus brought to a white heat or made red-hot, as desired. The loop is meanwhile slowly tightened until the whole thickness of the cervix is cut through. It is well to proceed very gradually and not to induce too white a heat, or otherwise the tissues are divided so rapidly that hæmorrhage may occur. The diseased mass being removed, the stump should now be examined carefully. A duckbill speculum being introduced, the surface of the stump should be explored with the finger, when, if any induration be detected, the tissues may still further be destroyed by means of the galvanic porcelain button, which may also be employed to arrest hæmorrhage.

If the operator prefer seeing what he is doing, a Sims's speculum may be employed and the sides of the vagina held apart by retractors, before adjusting the galvanic wire.

After removal, care must be taken not to exert too great pressure on the stump, if it be found requisite to plug the vagina on account of hæmorrhage. A stream of iced water will generally be found to be sufficient to stop any bleeding, the porcelain button being used if any small spouting arteries be detected. A few plugs of cotton-wool or strips of lint soaked in carbolized oil should then be packed in the vagina, a T-bandage applied, and the patient kept quiet in bed. Should any oozing continue, it may be necessary to remove the packing and apply the liq. ferri perchlor. to the stump, or this may be done before the packing is resorted to. The dressing should be removed the following day, the vagina syringed out with a little warm carbolie acid lotion, and then a strip of oiled lint again inserted; this being repeated for the first week or so. It will be necessary to watch the case and adopt means to prevent the os uteri closing during the process of cicatrization, which generally occupies two or three weeks at least. All risk of impregnation should be avoided. If any recurrence of the disease show itself, the application of nitric acid, bromine, or other similar agent should be resorted to from time to time.

Removal of the vaginal portion of the cervix may be accomplished by means of curved scissors, but should never be done if the galvano-cautery can possibly be obtained, as the risk of hæmorrhage which may prove uncontrollable is very great. The fact of having to drag on the cervix so as to bring it as near the vulva as possible to enable the scissors to be used effectually, constitutes a serious danger, in that in our effort to remove the whole of the diseased tissue we may readily cut into the retro-uterine peritoneal pouch.

The ordinary single wire or chain *écraseur* has also a similar objection, and the risks of septic absorption are much increased. If either of these methods be adopted it is well to apply the actual or benzoline cautery after removal of the cervix, so as to destroy

effectually all traces of the diseased tissue, as well as to prevent or check hæmorrhage and lessen the risk of septicæmia.

Whatever method be employed, some little inflammatory mischief with subsequent infiltration around the uterus generally occurs.

In those cases where the disease seems to be limited more to the cervical canal, extending up beyond the level of the vaginal portion of the cervix, Dr. Marion Sims's operation may be advisable. The patient being placed in the semi-prone position, a Sims's speculum is introduced into the vagina, the cervix held firmly by a tenaculum, and then a wedge-shaped portion excised by means of his own uterine knife, so as to form a cone-shaped cavity, the apex being at the internal os. A cautery is generally requisite to check hæmorrhage, it is also of service in enabling the operator to destroy the tissues more deeply than might be deemed prudent with the knife, and the risk of septic absorption is also lessened.

Emmet advises making a clean amputation of the cervix when we can do so, and to cover the stump by sliding the vaginal tissue over it, and securing the edges of the flaps with sutures.

Extirpation of the Uterus, by gastrotomy, has recently been advocated by Freund and others, when the disease has been discovered early, the uterus being still mobile and the vagina unaffected, as offering a better prospect of effecting a radical cure than by any other means. The steps of the operation are similar to those pursued in cases of ovariectomy up to a certain stage. Anæsthesia having been produced and the carbolic spray employed, the vagina is syringed out with a solution of carbolic acid, 1 in 10. An incision along the linea alba is then made, the intestines are drawn up out of the pelvis and held there in a soft linen cloth or by means of a large flat sponge wrung out of a 5 per cent. solution of carbolic acid. The fundus uteri is then seized by means of fenestrated forceps, or by means of a stout ligature passed through the tissue of the uterus, if this be healthy, and the organ drawn upwards by an assistant. The broad ligaments are then secured by three ligatures on either side, the upper loop being passed through the Fallopian tube above and the ovarian ligament below, the middle one transfixing the ovarian ligament above and the round ligament below, so as to avoid wounding any of the vessels contained in the broad ligaments.

The lowermost loop requires a special manœuvre; an unarmed perineal needle is pushed up from the vagina into the peritoneal cavity in *front* of the broad ligament, and anterior to the uterine artery, the site of which has previously been determined by bimanual examination. The needle is then threaded and drawn back into the vagina, returned through the same vaginal puncture into Douglas's pouch *behind* the broad ligament, unthreaded, and the ligature drawn upwards into the abdomen. The loop is now completed by transfixing the substance of the round ligament. The six ligatures are now tied, and the free ends of each one fastened together by a knot, the uppermost ligature on each side

having two knots made in it in order to distinguish it from the others. The broad ligament should next be severed on each side as far down as the round ligament, and all bleeding vessels secured.

The upper and posterior limits of the bladder having been defined by the catheter, the peritoneum uniting the bladder to the womb is divided by the knife. The front surface of the womb is then separated from the bladder by the fingers or the handle of a knife, the fundus uteri being meanwhile drawn upwards and backwards by an assistant out of the pelvis, by means of the transfixing ligature or forceps.

As soon as the anterior vaginal vault appears as a reddish fold at the bottom of the wound, it is punctured from the vaginal side by a guarded knife and the opening enlarged on both sides. One or two fingers are then passed from above through the wound into the os uteri, and the cervix is gradually drawn upward by their means until the posterior vaginal cul-de-sac is fully exposed, and the position of the two lowermost ligatures is seen. The incision can then be carried round the cervix so as to sever the uterus completely from its remaining attachments, without risk of dividing the lowest loop of ligatures, and with the least risk of injury to the ureters.

The uterus is then removed through the abdominal wound, and the parts thoroughly cleansed with a 5 per cent. solution of carbolic acid. If the woman has not yet reached the menopause, the ovaries should be also removed.

This may be done either by placing the uppermost loop of the three ligatures outside of the ovary, or by transfixing and tying the pedicle of each ovary independently of this loop. After the uterus is detached, the knotted ends of the six ligatures are pushed down through the hole in the vaginal vault and drawn tense. Strong traction is made upon the uppermost ligatures on either side, distinguished by the double knots, so as to bring the ligatured stumps of broad ligament down into the vagina. The uninjured portions of the anterior and posterior layers of pelvic peritoneum fall together in a transverse fold and obliterate the opening. The transverse slit thus formed is sewn up by gut sutures so as to shut off completely the peritoneal cavity from the vagina.

A tampon of cotton, secured by a colored string to distinguish it from the ligatures, soaked in (10 per cent.) carbolized oil, is then pushed up into the vagina, by which canal the ligatures also are brought out, and the operation is finally completed by closing up the abdominal wound.

Where the cervix is in a state of cancerous ulceration, or its condition is such as to cause a risk of contaminating the peritoneum, amputation may be performed previously, or the diseased mass scraped away and the surface touched with the actual cautery or strong carbolic acid.

As the operation is of necessity a prolonged one, the carbolic

spray should not be allowed to play directly into the abdominal cavity. The surface of the body should be protected as far as possible from exposure, so as to avoid the depressing influence of cold. The bladder must be emptied just previous to the operation, and great care exercised not to injure the ureters during the removal of the uterus.

FIG. 118.



Simon's Scoop.

Of twenty-eight recorded cases, only nine recoveries occurred, so that the operation must still be regarded as one requiring further experience to determine its merits.

Even when the disease has not been detected sufficiently early to allow of its complete eradication, it may still not only be justifiable but advisable to remove as much of the diseased mass as possible, in order to diminish hæmorrhage and fœtid discharge and lessen the risk of septic absorption. If any large vegetating surface exist, the galvano-cautery may first be used to remove this, and then as much more diseased tissue as deemed prudent removed, by *scraping* the exposed surface, either with Recamier's or Sims's curette, or by means of Simon's scoop (Fig. 118), or one bent at right angles as in Fig. 119.

The selection of a sharp scoop or blunt curette will depend upon the nature of the mass to be removed, whether it be deeply imbedded in the uterine tissue or is more superficial.

The deeper we get the greater the caution that must be employed not to tear through the peritoneal border of the uterus. The normal tissue being more resistant than the diseased, and the latter more friable, this danger may be avoided if the examining finger explore from time to time the condition of the surface and care be taken to employ a blunt curette.

Unless the patient be very nervous, it is not necessary to give an anæsthetic, as the operation is comparatively painless, nor is it requisite to use a speculum, the operator having to depend upon the sense of touch.

Hæmorrhage is often very free, and the operation should never be undertaken unless either the actual, benzoline, or galvanic cautery are at hand to sear the surface so as to check bleeding. In many cases it is prudent, having removed the superficial portions of the diseased mass, to employ the cautery only for the deeper structures. Either Sims's speculum or a cylinder made of boxwood or ivory, from one to two inches or more in diameter, and varying in length

FIG. 119.



Scoop bent at right angles.

from four to six inches, depending upon the capacity of the vagina, should then be inserted, so as to expose the surface to view and enable the cautery to be employed without injury to the vulva.

Where the disease has advanced to the ulcerative stage, the vagina is implicated, the rectum or bladder involved, and infiltration into the deep pelvic tissues has taken place, the cancerous cachexia being well pronounced, it is seldom expedient to attempt any operative interference with a view to removal of diseased tissue. Still, where the hæmorrhage and discharge are very profuse and the patient's powers are not utterly prostrated, the application of one or other form of cautery to the surface, or of the strong perchloride of iron or other similar agent may be admissible.

Certain chemical agents have from time to time been recommended as local applications for the destruction of the diseased mass. Of these the strong nitric acid, bromine, potassa fusa, potassa cum calce, chloride of zinc, strong acetic acid, chromic acid, sulphuric acid, sodium ethylate, are the chief.

Where the practitioner cannot command either of the forms of cautery previously alluded to, the application of the strong *nitric acid* offers certain advantages. If efficiently applied it relieves pain, arrests hæmorrhage, and lessens the amount of discharge.

To apply it, a Fergusson's glass speculum, as large as the vagina will admit, must first be passed up to the cervix, against which the end is firmly pressed. The surface having been mopped as dry as possible by means of cotton-wool, a Playfair's probe, coated with the same material tightly wound around it, is saturated with the acid, any superfluity being carefully pressed out against the neck of the bottle. The acid is then applied thoroughly to the whole of the diseased surface, the point of the probe being also pressed into any irregularities so as to destroy more effectually the mass. It is well to have several probes ready, so that fresh relays of acid may be employed. A mop soaked in a saturated solution of carbonate of soda should then be used to neutralize any excess of acid and prevent it injuring the vagina. A plug of cotton-wool soaked in glycerin is then passed up to the cervix uteri and left here for the next twelve hours or so.

The same precautions will need to be taken if either of the other strong acids be selected. If chromic acid be employed, the crystals are moistened with water, so as to make a fresh saturated solution. *Acetic acid*, added to a section of cancer on the microscopic slide, dissolves the cell-walls and also affects the nuclei. Not coagulating albumen, the acid may diffuse itself through a tumor, reaching every part equally, and may probably produce similar results when the cells are *in situ*. For this reason Dr. Broadbent suggests injecting equal parts of acetic acid and water into the issue of the cervix, thereby hoping to put an end to the dividing and multiplying of the cells, and consequently to arrest the growth of the tumor.

Sulphuric acid may be employed in a similar manner to the

method described for nitric acid, asbestos being employed in place of cotton, or the acid may be made into a kind of paste with asbestos and thus applied to the cervix, whilst the speculum is retained in the vagina. A solution of carbonate of soda should then be injected so as to wash away and neutralize every trace of acid. A plug of cotton-wool soaked in oil or glycerin should then be inserted and left *in situ* for the next twelve hours or so.

Bromine is regarded as exercising a special influence in destroying cancer-cells, and has been tried with marked benefit in many cases. Care must be taken in preparing the solution not to inhale the fumes, which are very irritating. One part of bromide is dissolved in five parts of rectified spirit.

A small pledget of cotton-wool the size of a nut is saturated with the solution and passed up through the speculum to the cervix uteri. This is covered over with a piece of gutta-percha tissue, and a large plug of cotton-wool soaked in carbonate of soda then passed into the vagina to neutralize any excess of bromine that may escape. The whole is left *in situ* for from six to twelve hours, when it should be removed, and warm water injected into the vagina to remove all traces of the bromine. Where any distinct nodules of diseased tissue are detected, it is advisable to inject some of the bromine solution into them by means of an elongated hypodermic syringe, the canula of which is made of platinum.

Potassa fusa, or what is better still, as being more manageable, *potassa cum calce*, in the proportion of two of quicklime to one of caustic potash, fused into sticks, is sometimes applied. It should never be done unless the patient be in bed and remain quietly for some few days or more, until all irritation from its application has subsided.

As large a Fergusson's speculum as the vagina will tolerate having been passed up to the cervix—this latter must be carefully cleansed and dried—a dossil of cotton-wool saturated with vinegar or acetic acid is then passed gently just within the os, and more of the same material similarly prepared should be packed round the cervix, so as to neutralize any excess of the alkali and prevent the vagina being injured. The stick of *potassa cum calce*, secured in a caustic-holder, is then pressed firmly against the cervix, changing the point of application every few seconds, until the whole surface has been cauterized.

A solution of equal parts of vinegar and water should then be injected into the speculum, withdrawing this latter a little, so as to allow the fluid to circulate freely all round the cul-de-sac of the vagina. The pledget of cotton-wool from the os uteri should then be removed, and the vagina washed out thoroughly. A tampon of cotton-wool saturated with glycerin is then passed up to the cervix and the speculum withdrawn. A morphia suppository may be passed *per anum*, or a full dose of opium given to allay pain and procure rest.

Whenever *caustics* are employed they should be applied as thoroughly as the circumstances of the case will permit, otherwise

whilst the superficial portions are being destroyed increased action is set up in the deeper portions where the caustic has not yet reached, and thus the growth of the cancer is in reality augmented instead of being retarded.

If caustics are employed with a curative intention, they must be used early, fully, and decisively (De Morgan).

The caustic treatment is especially useful in cases where the patients have an invincible horror of the knife. It is more applicable to the disease when it occurs in the mammæ or other superficial structures than it is to the uterine manifestation of the disease.

It is well to bear in mind that peritonitis, pelvic cellulitis, phlegmasia dolens, thrombosis in the pelvic veins, and even tetanus have followed as a result of the operation of applying caustics, and therefore every precaution should be taken both in forewarning the patient of the possibility of such a sequence, in keeping her strictly quiet for several days following the application, and in promptly allaying any irritation that may be set up by means of opium and other appropriate remedies.

Agents such as chloral hydrate, chlorate of potash, and pepsin, applied in form of powder to the cervix, and kept there by means of a tampon moistened with glycerin or water, have been recommended strongly and deserve a trial.

To be of service they must be applied once or twice daily, and their employment persevered in for a lengthened period. A saturated solution of the salt does equally well. Chloral acts as a local sedative as well as a disinfectant. A solution of ten to thirty grains to the ounce answers best. A plug of cotton-wool is saturated with this and applied to the diseased surface.

Palliative Treatment.—Unfortunately, it too often happens that the disease has already made such progress before the patient applies for relief that all hope of a radical cure being effected is futile. We can but treat symptoms. Pain, hæmorrhage, and offensive discharge being the three most prominent symptoms, our attention is commonly directed to relieving these.

Pain can be best allayed by means of opium in some form. It is always desirable to attempt this at first by the employment of suppositories, so as to leave the stomach free for the assimilation of nourishment. Five grains of pil. saponis co., one grain of the extract of opium, morphia in half to one grain doses, combined or not with the twentieth of a grain of atropin, either made up with cocoa-butter or the isinglass and glycerin mass, may be inserted in the rectum, or a starch and opium injection, containing mxx-lx of tincture of opium, may be employed.

The hypodermic injection of morphia, or of morphia and atropin, answers well in many cases, but unless the patient or some nurse or friend be instructed how to inject it, the duty of attending punctually at stated hours daily for many consecutive months is apt to become very irksome to the practitioner. It is well to begin with about a third of a grain of morphia and gradually increase the dose as necessity requires, or lessen the intervals, or both.

As the pain increases in severity, *opium* in some form, by the mouth, generally becomes necessary; in fact, the patient should be encouraged to become an opium-eater. Solid Turkey opium, in doses sufficiently large to effectually assuage pain, commencing with half a grain, and increasing this up to one, two, or three grains, every four, three, or two hours should be given. Some patients prefer Battley's liquor opii sedativus, chlorodyn, nepenthe, or the alkaloid morphia itself.

Instances are recorded where patients have taken as much as 120 grains of solid opium, three pints of laudanum, or three drachms of morphia in the twenty-four hours, and kept up its administration for many consecutive months.

Other sedatives, such as camphor and hyoseyamus, cannabis indica, belladonna, conium, chloral, etc., may be tried, but sooner or later opium, in some form, is instinctively selected as the drug that affords most relief.

Various local applications have been tried from time to time to allay pain, such as cold by means of ice, iced water injections, and ether spray, but their influence is but temporary. Chloroform vapor and carbonic acid have also been tried, but with only slight results. Iodoform and tannin in equal proportions may be dusted over the surface; the odor of the former is thus to a great extent destroyed, and the mixture serves to relieve pain as well as correct fœtor.

Hæmorrhage when profuse will need to be restrained, though it has often been noticed that pain and hæmorrhage occur in an inverse ratio to each other, the pain being most severe when hæmorrhage is slight, and disappearing to a great extent when this latter is profuse. Still there are limits beyond which it is not prudent to allow the hæmorrhage to go, as the patient's powers become exhausted. The first indication is to modify the condition of the diseased surface by one or other of the methods already suggested, removal of as much of the disease as practicable by cautery or scraping, so as to lessen the morbid activity and the determination of blood to it.

The next is to apply such caustics or styptics as will exert a direct influence in preventing hæmorrhage. Chromic, nitric, or carbolic acid, perchloride or persulphate of iron, powdered sulphate of zinc, etc., may be applied as previously advised. Astringent lotions, such as a saturated solution of alum, iron alum, acetate of lead, persulphate of iron, etc., may be employed by the patient herself or by a nurse.

Lastly, we must endeavor to regulate and moderate vascular excitement by means of salines, digitalis, bromides, aperients, ergot, rest at the menstrual periods, and other similar measures.

Should a severe burst of hæmorrhage occur when skilled assistance is not available, the vagina may be syringed out with ice-cold water, or water as hot as the patient can well bear it, and then a plug of cotton-wool in which powdered persulphate of iron has been incorporated, with a string attached, introduced into the

vagina, pressed firmly up against the bleeding surface and retained there for an hour or two, when it should be carefully withdrawn; or a good-sized plug of cotton-wool soaked in a saturated solution of alum may be similarly employed, the patient meanwhile reclining on the couch or in bed, or even lying with the hips somewhat elevated.

To correct the *fœtor* of the discharge, cleanliness is the first requisite. Injections of acetate of lead (ʒj ad Oj aquam), alum (ʒj ad Oj), glycerin of carbolic acid (ʒij ad Oj), chlorate of potash (ʒj ad Oj), chloral hydrate (ʒss-j ad Oj), tincture of iodine (ʒj-ij ad Oj), sol. bromine. B.P. (ʒv ad Oj), liquor sodæ chlor. (ʒij ad Oj), chloride of zinc (ʒss-ʒij ad Oj), or creasote (ʒxx ad Oj), are among the most useful. The acetate of lead is not only a hæmostatic, but also deodorant and sedative. Alum is one of the best deodorants. Carbolic acid is, however, one of the most certain and effectual.

Small pillows filled with charcoal roughly powdered, if changed sufficiently often, say once a week, are of service in these cases. A double case of ticking and linen is necessary to prevent the charcoal soiling the sheets. Small wooden boxes, about six to eight inches long and four inches wide, with a perforated zinc top filled with small lumps of chalk saturated with carbolic acid, also prove very useful.

A saucer filled with a mixture of common salt and binoxide of manganese, in the proportion of seven and a half of the former to six of the latter, may be allowed to stand under the bed or in the room. When a little strong sulphuric acid is added to this, chlorine is generated and forms a valuable disinfectant.

Constitutional Treatment.—It will frequently be noticed that patients afflicted with cancer are in good general health at the commencement, well-nourished, and even robust, showing that the disease does not arise from want of tone or defect of nutrition. Under these circumstances it is seldom advisable to suggest the patient's taking plenty of nourishment and stimulants to "keep her up," as the disease is probably thereby increased and its growth accelerated. The better plan is to take a light, unstimulating diet, such as milk and farinaceous food, and to avoid alcohol, unless for special reasons.

Physiological rest is absolutely essential; fatal attacks of hæmorrhage have before now resulted from a neglect of this precaution; in any case the disease would be rendered more active, and if pregnancy should happen to occur, the risk would be very great at the time of parturition.

It is by no means requisite to enjoin complete rest, provided the pain and hæmorrhage are not increased by moderate exercise, whether walking or driving. The mere fact of keeping the patient constantly indoors has a prejudicial effect on the general health, and is apt to depress the mind very greatly. As to the effect of drugs, no remedy has yet been found that has borne the test of prolonged experience as exercising any specific influence on the

progress or cure of cancer. Dr. Clay has recently recommended strongly Chian turpentine. He asserts that "it appears to act upon the periphery of the growth with great vigor, causing the speedy disappearance of the cancerous infiltration, and thereby arresting the further development of the tumor. It produces equally efficient results on the whole mass, seemingly destroying its vitality but more slowly. It appears to dissolve all the cancer-cells, leaving the vessels to become subsequently atrophied, and the former structures to gradually gain a comparatively normal condition. It is a most efficient anodyne, causing an entire cessation of pain in a few days, and far more effectually than any sedative."

He prescribes six grains of Chian turpentine; flowers of sulphur, four grains; to be made into two pills, to be taken every four hours. Twenty-five grains daily is the maximum dose which can be safely and continuously given.

Another mode of prescribing it is by dissolving the drug in double the quantity of ether, and then giving a mixture composed of tinct. terebinth. Chia ether. ℥ss; sulphur. subl. gr. xl; mucilag. tragacanth. ℥iv; syrup. ℥j; aquam ℥xvj. An ounce thrice daily or oftener.

The marvellous results recorded by Dr. Clay have not been attained by other observers; in fact, in other hands, the drug has been absolutely inert, failing both to relieve pain or in any way arrest the progress of the disease. Even making every allowance for the possibility of impure specimens being used, there is a singular unanimity of opinion as to the utter uselessness of the drug, and if subsequent experience should confirm this, the sooner the drug is erased from the list of vaunted specifics the better for suffering humanity.

It would serve no wise purpose to mention the innumerable list of drugs reputed from time to time to exercise a curative influence on cancer. Mercury, iodine, arsenic, bromine, conium, have all been tried without standing the test of time.

Iron in combination with salines often proves of service in improving materially the general health, but has little or no influence in arresting the progress of the disease. Quinine in some cases does good. Ergot and gallic acid have been prescribed with a view to control hæmorrhage. Cod-liver oil is useful in improving the nutrition of the body. Some form of aperient is generally requisite, the simpler the better. Pills containing aloes and belladonna, confection of senna, or an enema may be employed.

Cancer of the Body of the Uterus.—This affection is by no means so rare as generally supposed. It is more common in nulliparæ, and, as a rule, occurs later in life than carcinoma of the cervix. It commences in the body of the uterus, but may extend to the cervix later on, the uterus remaining mobile for a considerable period after the disease has been recognized.

Pathological Anatomy.—When the body of the uterus is primarily affected with cancer, it is generally in one of two forms, true carcinoma, or more frequently still, sarcoma, either round-celled or

spindle-celled. True carcinoma commences generally in the uterine glands; it is doubtful whether it originates in the parenchyma of the uterus. It may occur as isolated nodules, or may infiltrate the whole organ diffusely.

The cells of carcinoma generally resemble those of the epithelium from which it grows; there is little intercellular tissue; the vessels run in the fibrous tissue, not among the cells, and multiplication of cells is by endogenous formation (Butlin).

Symptoms.—Hæmorrhage is generally the most prominent symptom, associated usually with foetid discharge. Pain, severe and lancinating in character, may be present almost from the commencement, or may not occur until the disease has made marked progress, and the neighboring organs are becoming infiltrated. At this stage the cancerous cachexia is manifested, and the vital forces rapidly deteriorate.

Physical Signs.—On examination the uterus will be found to be enlarged and indurated, often tender on pressure. Profuse hæmorrhage generally occurs on passing the uterine sound, which seldom enters the normal distance. The cervix, unless the disease has extended to this portion, is normal in consistence, the os often patulous.

Differentiation.—The conditions most liable to be confounded with cancer of the uterus are fibroid tumors, or large fibrous polypi, more especially if sloughing has occurred.

Retained portions of placenta, and cystic degeneration of the chorion, have before now led to the supposition that cancer of the body of the uterus existed. Intra-uterine vegetations have also been mistaken for cancer. In these three latter conditions, however, pain is seldom severe, and the discharge is not often offensive in the two last-named.

In case of fibroid tumors there is generally a history of menorrhagia extending over several years, the uterine cavity is usually longer, and profuse hæmorrhage on passing the uterine sound seldom occurs as in cases of cancer. Dilatation of the cervix will enable us to explore the cavity of the uterus with the finger, and ascertain the condition of its surface, whether vegetations or a soft fungoid mass exists, or whether an intra-uterine polypus be present. Care must be taken, if the uterine sound be employed, not to use any violence, as otherwise the end may perforate the softened diseased fundus and set up peritonitis which may prove fatal.

The only sure method of settling the question of malignancy is by removing a small portion of the mass and examining it under the microscope. To accomplish this, the blunt wire curette may be passed in, or the end of a silver catheter turned round *in utero*, and a small fragment thus scraped off or brought away.

Should these means fail, the cervix may be dilated by means of a sponge tent, and the interior explored with the finger, a small piece being detached with the finger-nail or a curette. This should be placed in a solution of equal parts of glycerin and water, and submitted to some competent microscopist for examination.

Progress.—The disease, commencing at the fundus, may extend to the cervix and neighboring organs, or may involve distant organs by metastasis. Cavities are not infrequently formed in the uterine wall with gangrenous or semi-purulent contents; these may extend outwards, perforating the peritoneum, and causing fatal peritonitis.

Death usually results, as in cancer of the cervix, from prolonged hæmorrhage and exhaustion.

Treatment.—If the nature of the affection can be determined in the early stage, whilst the uterus is still mobile, and the surrounding organs are not implicated, extirpation of the entire uterus by Freund's method may be practised with a fair prospect of success.

As a rule the treatment can only be palliative. Pain must be relieved by opiates.

If the hæmorrhage be very severe, the cervix may be dilated, the interior of the uterus scraped out with the blunt or sharp curette. Simon's scoop, or the strong nitric acid applied. If any mass sufficiently large be detected, it may be removed with the *écraseur* or galvano-cautery.

Sarcoma of the Uterus.

Definition.—The sarcomata are tumors consisting of embryonic connective tissue. They include what have generally been known in this country as fibro-plastic, fibro-nucleated, recurrent fibroid and myeloid tumors.

The sarcomata occur most frequently in early and middle life and, next to the cancers, are the most malignant of the new formations. They are especially characterized by their great tendency to extend locally and to infiltrate the surrounding structures, so that they are exceedingly prone to recur *in loco* after removal. They comparatively rarely infect the lymphatic glands, and in this respect present a marked contrast to the cancers. They are also very liable to become generally disseminated, although this is unusual in the earlier stages of the disease (Green).

Pathological Anatomy.—Two principal varieties occur in the uterus. The round, and the fusiform or spindle-shaped. The cells, which constitute nearly the whole of the growth, consist for the most part of masses of nucleated protoplasm, and rarely possess a limiting membrane.

The spindle-celled variety arises in the muscular tissue, often from degeneration of a fibroid, in fact it is often difficult to distinguish it from a fibroid, except by the microscope, and by the fact of its recurrence. It is generally of slower growth than the round-celled variety, and when it contains muscular tissue, is spoken of as myo-, or fibromyo-sarcoma. The round-celled variety, more distinctly malignant than the former, is of softer consistence, and from its frequent resemblance in physical characters to encephaloid, it is sometimes known as medullary, encephaloid, or soft sarcoma. It is distinguished from encephaloid cancer by the absence

of an alveolar stroma, and by the uniformity in the character of the cells. It is exceedingly vascular, rapidly assuming a fungating character, and breaking down readily, thus leading to hæmorrhage and foetid discharge. It extends rapidly by peripheral growth, infiltrating the surrounding structures, reproducing itself in internal organs, and often involving the lymphatic glands.

Symptoms.—These are similar to those occurring in cases of cancer; pain, hæmorrhage, offensive discharge, cachexia, etc.

The pain is generally a more prominent symptom than is the case in cancer of the cervix, though it is not uniformly present. In some instances it comes on early in the disease, and is both constant and severe, lancinating or stabbing, in others it does not appear until later.

The pain is due partly to the stretching of the muscular fibre, partly to the contractile efforts aroused by the parasitic growth, partly by the pressure of the enlarged uterus upon surrounding structures, partly to the invasion of surrounding structures by the disease, and partly to the nerves themselves being affected by it (Barnes).

The hæmorrhage is often very troublesome, and alternates with a pinkish watery or offensive mucous discharge, shreds or small portions of the tumor being occasionally passed. These symptoms occur earlier in the round-celled variety, being seldom present until quite late in the spindle-celled variety.

Physical Signs.—The tumor generally springs from the interior of the fundus, being more or less sessile, and projects into the cavity, in some cases assuming a polypoid form.

The uterine contractions excited by its presence ultimately serve to dilate the cervix, and thus allow the growth to be partially forced into the vagina. The surface is felt to be soft, spongy, and friable in the round-celled variety, but denser and firmer in the spindle-celled form. On conjoined manipulation the uterus may be felt to be enlarged, irregular in shape, and tender on pressure.

Differentiation.—The only way of determining the nature of the tumor is by examining a small portion of it under the microscope, when if it be sarcoma the characteristic appearances mentioned will be detected. The conditions most likely to be confounded with sarcoma are fibroid tumor, and cancer of the body of the uterus. The history will often assist us in forming an opinion, but the microscope alone can be relied on in determining the diagnosis.

Sarcoma occurs more frequently than carcinoma during the period of sexual activity.

Termination.—As a rule sarcoma runs a much slower course than carcinoma, not infrequently extending over a period of several years.

The soft, round-celled, and large spindle-celled varieties are usually much more malignant than the firmer, small spindle-celled growths. Their infiltrating powers are much greater. They sometimes infect the lymphatic glands, and they tend to reproduce themselves very rapidly in internal organs.

Death ultimately results from hæmorrhage, infiltration of the neighboring organs, interference with nutrition, or acute peritonitis.

Prognosis.—The ultimate issue is certain; the disease invariably proving fatal sooner or later, depending upon the variety, whether round- or spindle-celled, the former being more rapid in its development. As a rule, the softer and more vascular the tumor, and the less its tendency to form a fully developed tissue, the greater is its malignancy.

Treatment.—Extirpation of the uterus before the process of infiltration has taken place in the neighboring organs offers the only hope of removing the disease. Where the disease has progressed beyond this, the growth presenting through the dilated cervix, removal of as much of the mass as practicable by the galvano-cautery, écraseur, or other means, and the application of nitric acid to the base, may serve to arrest the progress of the disease for a time. If not already dilated, the cervix may be opened up by sponge tents.

CHAPTER XVIII.

DISEASES OF THE OVARIES.

Diseases of the Ovaries.—*Absence.*—Except in cases where the entire sexual apparatus is deficient, it very rarely happens that both ovaries are congenitally absent. Even when the uterus is absent, the ovaries are often found well developed.

When the ovaries are congenitally absent, in place of the usual sexual development at puberty, the period of childhood is indefinitely prolonged, the stature remaining small, the figure undeveloped, the mind often childish or deficient, even approaching to idiocy. In some instances the girl lacks vigor both of mind and body, suffers from depression of spirits, remaining a child without retaining the vivacity and cheerfulness of childhood. In other cases there is more or less approximation to the male type.

Manual exploration by the rectum may be justifiable in certain cases, and saves us from inflicting unnecessary interference in other ways.

There is a complete absence of any sexual feeling.

A peculiar condition, excessive obesity with idiocy, occasionally is witnessed in cases where the ovaries are presumed to be absent.

Imperfect Development.—The ovaries retaining their foetal condition, in place of becoming rapidly developed at puberty, is one of far more frequent occurrence than entire absence.

It is often associated with a rudimentary condition of the rest of the sexual apparatus; puberty is indefinitely postponed, menstruation, if it occur at all, commences very late, is generally very scanty, and is absent for long periods at a time, the menopause occurring very early.

Not infrequently we find a marked tendency to masculinity, the voice being harsh, the mammæ undeveloped, the chin and legs covered with hair, and occasionally a well-marked moustache, the stature small but muscular.

The pelvis is either uniformly small, undeveloped, or of masculine type. The sexual feeling is either absent, causing complete frigidity, or so slight as to prove a source of much unhappiness should the patient marry.

Even by rectal exploration it may be impossible to diagnose between complete absence and imperfect development of the ovaries. If, with arrested puberty, there is complete absence of any sexual feelings, and menstruation cannot be induced by the means to be mentioned directly, it will be well to abandon any further attempts at treatment.

Atrophy of the Ovaries may occur independently of the normal involution which takes place at the menopause from some pelvic inflammatory mischief, such as cellulitis, or still more frequently in consequence of pelvic peritonitis, or even acute ovaritis. The dense surrounding deposit and adhesions prevent the natural liberation of the ovules, the existing follicles shrink, and the stroma retracts.

Any severe constitutional depression, such as results from a serious or prolonged exhaustive illness, or even some sudden shock or deep sorrow, may result in atrophy, more especially if there has been feeble development of the ovaries from the first.

Treatment.—Where complete absence is presumed or proved, nothing can be done. If imperfect development be suspected, something may be attained by stimulating the sexual organs by means of a general tonic course of treatment, in which iron plays an important part; nutritious diet, and regular exercise in the fresh air, being also resorted to.

Uterine irritation by means of laminaria tents, occasionally inserted, the employment of the hot-water douche, the wearing of an intra-uterine galvanic stem, may also be tried with a view to irritating the ovaries.

Direct local stimulation to the ovaries by means of Faradization may also be tried, one pole of the battery being applied to each ovary successively, the other being placed over the sacrum, or applied to the cervix uteri, or even to the interior of the uterus by a rheophore shaped like a sound, protected by some non-conducting material excepting the terminal $2\frac{1}{2}$ inches.

The influence of marriage has occasionally a beneficial result, especially if pregnancy ensue.

Where atrophy has occurred from pelvic peritonitis, we must be extremely careful in attempting to irritate the ovary. Intra-uterine stems are distinctly contra-indicated.

Apoplexy of the Ovaries occurs as a physiological act at each menstrual period; where it is excessive, the hæmorrhage continuing longer than natural, or returning after cessation, it constitutes a pathological process. The collection of blood may be as large as an orange, or the tunica albuginea of the ovary may rupture and the blood be effused into the peritoneal cavity, constituting pelvic hæmatocele.

Symptoms.—Sudden and violent pain in one ovarian region, with nausea, vomiting, and occasionally extreme exhaustion or collapse, occurring at the time of a menstrual period.

On examination by conjoined manipulation the ovary may be detected, enlarged and tender. Great care should be taken lest by pressure we rupture the cortical portion of the ovary, and so cause a hæmatocele.

Treatment.—Perfect rest and quiet; avoidance of all emotional disturbance. Poultices or fomentations with sedatives if the pain be urgent; a blister to the seat of pain later on.

Displacements of the Ovaries may arise from their increased weight

or bulk, due to hyperæmia or commencing cystic degeneration; from the pressure of neighboring organs or tumors; from relaxation of the supports which usually hold them in position; from displacements of the uterus as in retro-version and -flexion, or prolapse dragging the ovaries with it; or from inflammatory adhesions binding them down.

Prolapse of the ovary downwards and inwards towards the mesial line is the most usual displacement, the ovary descending into Douglas's pouch. Here it often becomes fixed from inflammation, the result of pressure or other injury.

Symptoms.—A peculiar sickening pain is generally complained of, often coming on in severe paroxysms, increased on defæcation and coitus, generally worse on standing or on walking. The pain is referred to the sacral and inguinal region, as of a throbbing, aching character, a sense of bursting being often spoken of at the menstrual period, when the pain is greatly intensified. This constitutes ovarian dysmenorrhœa.

On vaginal examination the prolapsed ovary, more often the left, is felt low down, slightly to one side of the uterus, as an oval or almond-shaped body, slightly irregular or nodular on its surface, extremely sensitive to the touch, a sickening pain being produced on pressure, analogous to that of the testicle, and often giving rise to hysterical manifestations.

Examination *per rectum* enables us to pass the end of the finger above the ovary, and thus to ascertain more definitely the exact size and condition of the organ.

Diagnosis.—A retroflexed fundus uteri is not infrequently mistaken for a prolapsed ovary. This is, as a rule, denser, less mobile, and less sensitive than an inflamed prolapsed ovary.

The uterine sound will soon clear up any difficulty. If this passes in the normal direction, upwards and forwards, the fundus uteri being felt behind the pubes, the tumor posteriorly remaining unaffected, we may conclude that this latter is the prolapsed ovary. But if the sound passes backwards and downwards, and the fundus uteri can be lifted out of its abnormal position, no tumor being then detected posteriorly, it is a case of retroflexion of the uterus.

Treatment.—The genu-pectoral position, frequently and perseveringly resorted to, often proves of much service. The introduction of a Hodge's pessary, either with an elastic or broad posterior end, carefully adjusted so as to put the posterior cul-de-sac on the stretch, will also prove useful.

The bowels must be carefully regulated by means of alteratives, salines, enemata, etc.

If much pain be present, a few leeches may be applied to the posterior cul-de-sac, of the vagina; suppositories or pessaries of morphia, conium, or belladonna may be employed at bedtime. All unnecessary fatigue in the way of prolonged standing, walking, etc., especially at the monthly periods, must be avoided. Hot-water vaginal or rectal injections may be tried.

The bromide of potassium is often of service.

Hernia of the Ovary.—This may be congenital or acquired. In very rare instances the ovary descends into the labium majus, or into a pouch of peritoneum, which remains patent in the inguinal canal as a congenital error of development, giving rise to the supposition of hermaphroditism. In these latter cases, however, it is more likely to be a testicle than an ovary.

Acquired hernia of the ovary may occur shortly after delivery, when the attachments are often very loose. It is generally associated with hernia of intestine or omentum, and is more commonly inguinal, though it may also occur in cases of vaginal, crural, abdominal, or even ischiatic hernia.

Periodical swelling and tenderness at the times when the catamenia are present, with a dragging pain when the patient lies on the opposite side, and tenderness on pressure, should suggest the nature of the case.

Treatment.—In congenital or irreducible hernia the ovary may be protected from pressure by a concave shield. If the hernia be reducible, the taxis and a truss should be applied. If the ovary becomes inflamed and fixed by adhesions, and produces considerable discomfort, it may be removed by operation. This has frequently been done successfully.

Inflammation of the Ovary.—*Oöphoritis*; *Ovaritis*.—This condition probably occurs more frequently than we are apt to imagine, but inasmuch as it is seldom fatal, we have not frequent opportunities of verifying the diagnosis. On making post-mortem examinations of patients who have died from other causes, it is not at all infrequent to find fibrous bands or adhesions surrounding the ovary, induration of the stroma, and thickening and opacity of the peritoneum covering the ovary, where no history of previous oöphoritis existed, or had been suspected or inquired into. It is usually associated with other forms of pelvic inflammation, and occurs more frequently in puerperal than in non-puerperal patients.

It is in the latter class only that we shall here consider it. It is usually spoken of as acute and chronic.

Acute Oöphoritis, uncomplicated by inflammation of the adjoining peritoneum or cellular tissue, is rarely met with, and the post-mortem records of cases are so few, that to divide the affection into parenchymatous, follicular, and peritoneal seems an unnecessary refinement, and will serve no useful purpose.

Pathology.—At first the ovary is extremely congested, enlarged, and heavy. It then becomes softer in consistency and friable, much increased in size and weight, infiltrated with serum, with hæmorrhagic points which become purulent later on; suppuration takes place, the organ becomes soft and diffuent, disorganized, or converted into an abscess.

Causes.—Imprudences during menstruation, from exposure to cold or fatigue, immoderate sexual indulgence, secondary extension of inflammation from the neighboring organs (the uterus, Fallopian tubes, and broad ligaments); operations upon the uterus, in-

section of laminaria, sponge tents, or stem pessaries into the uterus, intra-uterine injections.

In the majority of cases the exciting cause will be found to be pelvic cellulitis or peritonitis, often due to gonorrhœa. Oöphoritis may also occur in the course of acute fevers, as small-pox, etc.

Symptoms.—These are similar to those of pelvic cellulitis and peritonitis, elsewhere described, and it is often impossible to distinguish them. There is generally severe pain in the region of the affected ovary, with great tenderness on pressure. On conjoined manipulation the ovary will be found to be exquisitely sensitive to the touch, somewhat lower in position than normal, and also enlarged; but frequently the accompanying inflammation of the other tissues and the extreme sensitiveness of the parts effectually preclude our detecting the ovary. Examination *per rectum* will often enable us to ascertain more clearly and with far less discomfort, especially in virgins, the exact condition of the ovary.

Menstruation may be either suppressed or the flow may be increased in quantity.

In severe cases, especially where the peritoneum becomes involved, or is already inflamed, oöphoritis may continue for many weeks or months, with more or less marked remissions or distinct intermissions, the paroxysms being synchronous with the catamenial epochs.

Results.—Resolution and recovery may ensue, or the inflammation may become chronic.

The exudation may ultimately disappear, becoming absorbed, or may remain as firm fibrous bands or adhesions, binding down the ovary to the neighboring organs, interfering with its functions and so causing sterility.

The adhesions may be so dense, or the exudation so firm, as to encapsule the ovary and lead to atrophy of its tissue.

The ovary may undergo suppuration, an abscess forming which may burst into the peritoneal cavity and produce general peritonitis, which ends fatally, or cause death at once by shock or collapse. Small perforations may take place, setting up more circumscribed peritonitis. Adhesions may form between the bladder or intestine, the pus becoming discharged by fistulous communications, or may even gain exit by the vagina or through the abdominal wall.

Where large quantities of pus escape, suppuration taking place in the cavity of some ovarian cyst is generally the explanation.

Diagnosis.—This is often impossible. Intense pain in either ovarian region is not sufficient to constitute oöphoritis; still, the localization of the pain and tenderness, with the detection of an enlarged, exquisitely sensitive swelling in the position of the ovary, will assist materially in forming an opinion. The association of oöphoritis with peri-metric inflammation, either as cause or consequence, is generally so intimate as to preclude our coming to any certain conclusion.

Prognosis.—As a rule this is favorable, though the affection may

prove fatal in a very short time, may remain active for many months, give rise to frequent relapses, or cause death by perforation of an abscess.

Treatment.—Perfect rest, leeches to the groin or perineum, hot fomentations or poultices, opium suppositories. Where suppuration occurs, and fluctuation can be detected *per vaginam*, the aspirator trocar may be employed to evacuate the pus. Especial care must be taken to avoid anything likely to cause rupture of the abscess into the peritoneal cavity.

Chronic Oöphoritis is an affection apparently of far more common occurrence than the acute. It may be preceded by the acute form, or commence in a subacute manner as frequently witnessed in connection with parturition, or may arise independently in connection with dysmenorrhœa. As a primary affection which creates secondary uterine disorder and results in dysmenorrhœa, sterility, and hysteria, it is by no means rare.

Congestion of the ovaries beyond the physiological limit, with severe pain, may occur. But intensity of pain is not necessarily evidence of inflammation. As Dr. Barnes suggests: It may be true that the ovary proper may be inflamed alone, but it is hardly conceivable that repeated attacks of oöphoritis should fail to involve the peritoneal investment. It is moreover scarcely in accordance with the history of inflammation to return in an organ every month, to run its course in a few days, and to leave the organ essentially sound, that is, in a condition ultimately to perform its functions.

Causes.—Any influences calculated to keep up a state of hyperæmia of the ovary, such as is not infrequently met with in the unmated or the ill-mated, long engagements, disappointments in love, immoderate sexual excitement, masturbation, imperfect coitus, the strong emotional susceptibility of hysterical subjects, and other similar conditions, will be very liable to produce such a constant state of congestion as readily to pass the limits of health and become one of inflammation.

The ovary, increased in weight, becomes partially prolapsed, its venous circulation being thereby still further interfered with, hyperplasia with thickening of the capsule results, and the extrusion of the ovule by rupture of the follicle being thus rendered more difficult, inflammatory changes are apt to ensue, or cystic degeneration to take place.

In single women chronic oöphoritis will be found to be frequently associated with some form of dysmenorrhœa often dependent on some misplacement of the uterus. The affection is often relieved by marriage, even if pregnancy does not occur; menorrhagia, dysmenorrhœa, and other evidences of ovarian irritation becoming less marked.

The left ovary is more frequently affected than the right, doubtless, to the left ovarian vein opening into the renal in place of into the vena cava, as happens on the right side, but also to the pressure produced by the ever-recurring distention of the rectum

and sigmoid flexure on the venous circulation, especially in cases where constipation occurs. Latent gonorrhœa, or syphilis, may prove in some instances the exciting cause.

Pathology.—In acute cases we have seen that the ovary at first is enlarged, and subsequently becomes softened. In chronic cases hypertrophy of the parenchyma similar to the interstitial hyperplasia of other glands, as in cirrhosis of the liver, produces induration, the surface of the ovary becomes roughened or corrugated, the capsule thickened, so much so as to interfere with the rupture of the follicles at the menstrual periods, sanguineous effusion often takes place not only in the interior of the vesicles, but also in their immediate neighborhood, producing the so-called apoplexy of the ovary.

Cystic degeneration or atrophy may ensue, or the structure of the ovary be broken up by the formation of abscess. It is needless to enter upon the refinements of follicular and interstitial ovaritis.

Symptoms.—There is generally more or less fixed pain of a dull, heavy character over one or both ovaries, increased towards the menstrual period, aggravated by much standing, constipation, etc. If the ovary be prolapsed the pain is often severe on defæcation or coitus, described as of a sickening character.

The pain radiates from the ovary to the back and hips, often extending down the inner side of the thighs. It may be periodical at first, but ultimately becomes continuous. It is often worse the week before the period, and abates somewhat on the appearance of the flow if no cause of obstruction exist, though in some cases the pain is worse after the period, as if the ovarian congestion had aggravated the already existing mischief. In other cases the pain occurs midway between the periods, the so-called inter-menstrual dysmenorrhœa.

Menstruation is usually profuse in the early stages, being either increased in quantity, prolonged in duration, or too frequent. Amenorrhœa is a more frequent accompaniment of the later stages. There is, however, no invariable rule. Menstruation may be fairly normal, scanty, irregular, or profuse. This may be partially explained by the fact of one ovary only being involved, when according to Negrier's theory of the alternate action of the ovaries, ovulation may be normal when the healthy ovary is at work, there being no dysmenorrhœa or profuse menstruation, whereas these latter symptoms may be marked when the inflamed ovary is acting.

Some amount of uterine catarrh is often present, but whether this be the cause of the ovarian mischief or the consequence it is often difficult to say. The fact that when the disease of the cervical canal is cured by the application of caustics or other appropriate treatment the ovarian pain ceases, may prove that the latter was dependent upon the former, but the treatment applied to the uterus may have acted on the principle of derivation or counter-irritation, and so have cured the ovarian disease.

Physical Signs.—On conjoined manipulation we shall generally be able to detect on one or other, or both sides of the uterus, not

infrequently more towards Douglas's pouch, an oval, enlarged, extremely sensitive body, about the size of a Spanish olive, or even larger. Pressure upon this causes a feeling of nausea and often provokes hysteria.

The ovary is usually prolapsed, but in cases where the ovarian disorder is secondary to or symptomatic of preceding pelvic peritonitis, the organ is often bound down by adhesions which prevent its descent, and it may then be beyond the reach of the examining finger internally.

It will often be noticed that the abdominal muscles on the affected side are held tense and rigid so as to prevent any pressure externally. There is also a certain amount of fulness, due to flatulent distention of the intestine, often described by the patient as a tumor in the side. Rectal exploration will frequently enable us to detect the inflamed ovary more thoroughly than is practicable by the vagina.

The uterus is more often misplaced than not, retroflexion being the most usual. The cervix is often in an unhealthy condition. Other signs of pelvic mischief may also be present.

Diagnosis.—Attention to the symptoms and physical signs already enumerated, the exclusion of other forms of pelvic diseases, the detection of the inflamed ovary by conjoined manipulation, vaginal and rectal touch, will generally enable us to distinguish the nature of the affection.

If the fundus uteri be retroflexed, the introduction of the uterine sound will serve to discriminate the fundus from a prolapsed ovary, although the two are often bound together by adhesions and in some cases the diagnosis is very difficult.

Results.—In long-standing cases, the patients often develop marked symptoms of hysteria, anomalous sensations are complained of, the patients become extremely nervous and irritable, and often confirmed invalids. The general health is much impaired and anæmia results.

Professor Charcot has recently called attention to hystero-epilepsy with hallucinations bearing a constant relation to disorders of the ovary, mere pressure upon this organ being sufficient to produce the most marked manifestations.

Sterility is the rule, impregnation the exception, though it is possible that this latter may occur in those cases where only one ovary is involved, or where some follicles remain in a condition to bring forth healthy ova even when both ovaries are more or less affected.

Resolution may occur, but the affection is generally very intractable. The healthy structure of the ovary often becomes destroyed, the vesicles compressed and atrophied, amenorrhœa and sterility being the natural result. In septic cases suppuration and the formation of abscess generally ensues, peritonitis or even death from rupture of the abscess into the peritoneal cavity occurring in consequence.

Prognosis.—Although chronic oöphoritis does not often prove

fatal except when suppuration occurs and the abscess bursts into the peritoneal cavity, it is yet a very intractable disease, little amenable to treatment, often causing life-long suffering and exposing the patient to constant danger from the liability to peritonitis. Many cases are rendered incurable in consequence of the profound anæmia induced by the habit of resorting to opium to allay pain. Epilepsy and insanity are not infrequently the result of the long-continued ovarian irritation.

Treatment.—Chronic oöphoritis being on all hands admitted to be a very intractable malady, we must be extremely careful to avoid all influences calculated to depress the vital forces, or to encourage any habits detrimental to the general well-being of the individual who is the subject of this affection.

Prolonged rest, either in bed or on the couch, should not as a rule be suggested, the impairment of the general health from the loss of appetite, constipation, sleeplessness, want of exercise, and concentration of the patient's thoughts upon herself will probably do far more harm than good. At the same time it will be well to avoid any prolonged or undue exertion. The patient should not be allowed either to stand or sit, to walk or ride, too long at a time. The employment of the treadle sewing-machine, practising the piano or harmonium, standing in the laundry, at the ironing-board, or in the school-room teaching, or behind the counter, and other similar fatiguing occupations, should as far as possible be avoided.

A certain amount of rest at the menstrual period is not only advisable, but often absolutely necessary.

Physiological rest is indicated. All influences calculated to excite the emotions or the sexual passions in the unmarried should be carefully avoided. In married patients it is not absolutely requisite to abstain entirely from indulgence in sexual relations, but strict moderation must be enjoined; provided of course the act is not attended by any severe exacerbation of pain.

Should impregnation fortunately occur, and the ovaries thus obtain immunity from the periodical monthly congestions for the ensuing nine months, it will probably have a very beneficial influence upon the course of the disease.

As to local treatment, if the ovary be prolapsed, the insertion of a carefully adjusted light elastic ring or Hodge's pessary, so as to sustain the ovary at its proper level, thus ensuring rest and favoring the normal circulation in the organ, will probably afford marked relief. If any misplacement of the uterus exist, the pessary will also prove of service in reinstating it in its proper position, and so relieving any undue congestion. If menstruation be scanty or the local pain and tenderness very severe, the application of a few leeches to the cervix uteri, just before or immediately after the menstrual period, may be advisable. They should not, however, be repeated too frequently, for patients seldom bear depletion well in these cases.

The application of potassa c. calce to produce a small issue or

eschar on the cervix uteri, and so act as a derivative, has been recommended by Dr. Barnes. The complication of uterine disorders in many of these cases is sufficient to justify the treatment suggested.

Hot-water vaginal injections should be employed night and morning. Painting the cervix uteri and the upper portion of the vagina over once or twice a week with tincture of iodine has also been recommended. Fomentations or poultices to the lower abdomen should be used when requisite. Counter-irritation over the seat of pain in the inguinal or iliac region by means of blistering fluid, iodine liniment, or other similar application, should be kept up for months at a time.

As regards medicinal treatment, the iodide and bromide of potassium, as being calculated to promote absorption, relieve hyperæmia, and produce a sedative influence upon the sexual organs, have been strongly recommended. They will need to be persevered with for many months at a time, but their action should be carefully watched lest they tend to upset the digestion, cause marked mental depression, or in any way impair the general health.

Where any syphilitic history exists, or there seems to be any constitutional taint of this disorder, the iodide and bromide may be combined with small doses of liq. hydr. perchl. and persevered with steadily for many months. It is often advisable to combine these with some preparation of quinine or bark—the tinct. cinch. co. for instance, or calumba or cascarilla.

Iron, as a rule, is not indicated in these cases, especially if menorrhagia or any active congestion be present, but where amenorrhœa exists, or marked nervous symptoms are developed, iron often proves of much value.

There are two agents not infrequently resorted to in these cases that the practitioner will need to be on his guard against. These are opium in its various forms, and alcohol. It is to be feared that the frequent resort to the use of morphia, hypodermically, as suppository, or by the mouth, tends to produce anorexia and in time anæmia, with neuralgia as a frequent accompaniment. A morbid craving for the drug is frequently engendered which at length becomes more detrimental to the general health than the original disease for which it was employed. Opium should be reserved as much as possible for acute paroxysms. Alcohol also has its evils. The glass of port wine taken in place of food to avert some threatened neuralgic attack, the tumbler of hot toddy at bedtime that steeps the senses in a happy oblivion for some hours to come, may ultimately grow into such a pernicious habit that it is impossible to break the patient of it.

Where much pain occurs at the menstrual period and there is other evidence of congestive dysmenorrhœa, warm hip-baths, or better still a full warm bath, will generally afford marked relief.

At other times, where the case is of long standing, the nervous symptoms marked or the general health much deteriorated, cold sponge or shower baths may be prescribed with benefit. Sea-bath

ing in summer, or a resort to some hydropathic establishment in winter, may also prove of service.

Battey's Operation.—Should all ordinary measures fail in procuring relief, and the continued pain and discomfort be so great as not only to embitter the patient's existence but also to render her a helpless and confirmed invalid, threatening her reason, or inducing recurring attacks of epileptiform mania or hystero-epilepsy, it will then become an anxious question whether removal of the ovaries by spaying should not be resorted to.

The operation has been done repeatedly both by vaginal as well as by abdominal section. The latter seems the preferable mode of proceeding in all cases where adhesions of the ovary are suspected or known to exist. If attempts be made through a vaginal incision to gouge out the adherent ovary piecemeal with the finger-nail, we incur the risk of leaving some of the organ behind, and also of producing so much hæmorrhage that it is almost impossible to restrain it.

The operation has thus far been performed about thirty times, with a result of three deaths—rather a large proportion—the abdominal having proved more dangerous than the vaginal section.

Dr. Sims sums up his opinion upon the operation as follows:

1. Remove both ovaries in every case.
2. As a rule, operate by abdominal section, because if the ovaries are bound down by adhesions, it is possible to remove them entire, whereas by the vaginal incision it is impossible.
3. If we are sure that there has been no pelvic inflammation, no cellulitis, no hæmatocele, no adhesions of the ovaries to the neighboring parts, then the operation may be made by the vagina, but not otherwise.

The vaginal operation is performed with the patient lying on the left side. A Sims's speculum is introduced, the cervix drawn down by a strong tenaculum, and Douglas's cul-de-sac opened by knife or scissors. The finger is then passed into the aperture to feel for the ovary, which is then seized by forceps or tenaculum, and drawn out into the vagina. It may be removed by means of the *écraseur*, or the application of a silk ligature, and then cut off, the stump being returned into the cavity, the opening being left to close gradually so as to admit of drainage. The presence of the stump, and rapid adhesions, prevent any prolapse of the intestines into the vagina.

The abdominal operation is performed in a similar manner to ordinary cases of ovariectomy, only on a smaller scale.

Dr. Battey himself, in a recent paper, thus points out the field for the application of the operation. The operation should never be one of election; it is applicable only to a certain class of cases—cases in the first place incurable by any other means; in the second place, cases menacing life; and in the third place cases from which we may reasonably expect to relieve the patients of the direful consequences of their disease by a change of life.

Three questions must be properly answered before deciding to

perform the operation. Is it a mortal case? Is it incurable by other known resources of the art? Is it curable by a change of life?

The first class of cases in which the operation is advised is where there is an absence of the uterus, with more or less irregular ovulation, and a violent nervousness of the system.

The second class of cases is where there is a complete occlusion of the whole utero-vaginal canal, attended with violent nervous or vascular perturbations.

A third class consists of cases of menstrual mania, or ovarian mania, where reason becomes dethroned in consequence of violent perturbations attendant upon the stoppage of the menstruation.

A fourth class of cases is where ovarian epilepsy is found.

In another class, there is a pernicious amenorrhœa that is utterly destroying the life of the patient.

Interstitial fibroid tumors, not amenable to any of the ordinary resources of art, afford another justification for operating in certain cases.

In cases of contracted pelvis, where abdominal section is required, he thinks it natural and proper to ligate and remove the ovaries. The operation offers great hope to a large number of women who suffer from ovarian disorders, attended with nervous manifestations of the most distressing character.

CHAPTER XIX.

OVARIAN TUMORS.

Ovarian Tumors.—These may be divided into the *Solid* and the *Cystic*.

The *Solid* are mainly represented by *Fibroma* and *Carcinoma*.
Tubercle and *Enchondroma* are exceedingly rare.

Spencer Wells reduces tumors of the ovary to three classes :

1. The adenoid tumors, composed of gland-structure in variously altered conditions.
 2. Tumors of a fibrous character, the result of growth from the connective tissue of the organ.
 3. Those tumors which assume a malignant form, and are essentially degenerations or new formations.
1. *Adenoid*: {
- a. Simple cysts—enlarged Graafian follicles.
 - b. Multiple cysts—cysts in apposition becoming multilocular.
 - c. Proliferous cysts—parent cysts with secondary cysts growing from the interior of cyst wall.
2. *Fibrous*—growth of stroma of ovary.
3. *Malignant*—cancer; tubercle.

Cystomata, or Cystic Tumors of the Ovary.—These may be divided into the *Simple Unilocular*, or barren cyst, containing fluid or unorganized matter; the *Multiple* or *Multilocular*, a variety of the former; the *Compound*, or *Proliferous*; and *Dermoid Cysts*. Peaslee adopts the term *Oligo-Cystic* (ὀλίγος, few, and κύστις, a cyst) *Cystoma*, as more distinctive than monocystic, and considers the latter as an accidental modification of the former; the occurrence of a tumor originally monocystic being extremely rare, and incapable of demonstration. Paucilocular has also been employed to designate the same condition.

Cystomata constitute by far the most frequent and important variety of ovarian tumor, and hence cannot but prove of much interest to the practitioner, since the advances of modern antiseptic surgery have enabled us to deal with them in a more satisfactory manner than was formerly the case.

Simple Ovarian Tumors.—The simple or *unilocular* ovarian cysts are organized sacs, containing fluid, which grow from some part of the ovary itself. They commence their growth as small vesicles, but no limit can be mentioned as to their ultimate size, except that of the containing power of the abdomen, and the extent to which the abdominal walls may be distended. The walls of even these enormous sacs are, after all, in their simple forms, only the continued growths of some of the original ovarian tissues. No

new elements are superadded. There is only a surplus of material, malarranged and out of place. At first, the cysts are seen projecting from the surface of the ovary, the remainder being imbedded in its stroma or enveloped by its fibrous tunic. The coats are then thin, membranous, and translucent, and not in any way to be distinguished from the natural structure of a Graafian follicle. With growth comes greater thickness, opacity, and firmness. There is no uniformity of thickness, which in different cases, or even in the same tumor, may vary from an inch to the extreme bursting point of tenuity. The histological elements of this coat are identical with those of ordinary fibrous tissue, consisting of fibres very difficult to disentangle, nucleated fibre-cells, and granules.

The vessels supplying the tumor enter at its base, enlarge with its growth, and ramify very freely on its inner surface. They form a complete network in and under the peritoneum; and the capillaries passing into the fibrous layer traverse it, and have a peculiar arrangement on the inside, where they form knots of anastomosis, with bulbous dilatations and terminal pouches, like, but less regular than, those found in the chorion. Outside, under the peritoneal covering, numerous large and tortuous veins may be traced plainly. Nerves pass with the vessels into the substance of the coats, and lymphatics, often of large size.

The simple ovarian cysts generally originate in a Graafian follicle, either before or after its rupture. When small they have a similar structure—a fibrous coat derived from the stroma of the ovary; an inner coat, lined by epithelium, corresponding to the tunica propria of the follicle. They contain a clear fluid, and the ovum has in some instances been found in such cysts; the condition is evidently due to hypersecretion of the fluid of the follicle. In many cases the follicles are so deeply seated in the structure of the ovary, that though the ovum is fully formed and ready for impregnation, there is no possibility of its escape by rupture; and its unwonted presence in such a position may give rise to morbid action or there may be thickening and induration of the coats of the follicle in consequence of inflammation preventing the escape of the ovule. The fact that dysmenorrhœa is a frequent antecedent of ovarian dropsy tends to corroborate the opinion that some obstruction to the due maturation and escape of ova is one cause of the production of ovarian tumors.

The comparatively great frequency of these follicular dropsies in women who have long suffered from chlorosis or other disease combined with amenorrhœa may be explained by the fact that the menstrual congestions in the ovaries not attaining sufficient intensity to effect the bursting of the follicular wall, the result is an increase of secretion and its accumulation in the cavity.

Multiple cysts are formed by two or more Graafian follicles in the same ovary undergoing cystic transformation simultaneously. Failing in the evolution of an ovum they abort, grow side by side, fill with fluid, become an enormous assemblage of similar units.

disfiguring and stimulating each other by pressure and reflex action, forming preternatural adhesions within and without, and at length, by their very excess of development, inducing in their component tissues the inevitable process of involution, and in the organized being to which they belong, a lingering decay and death. In this is recognizable an adenoid tumor of the true type and tendency, aggressive and destructive, though not essentially malignant. Gaining a certain size, however, it generally happens that one out of the many dropsical follicles takes the lead of the rest. Annihilating some of its neighbors, it dwarfs others, lessens their vitality, vitiates their contents, and fills more rapidly than they. And this struggle for existence seldom goes on long without destroying their integrity. Pressure and expansion cause obstruction to the circulation in the cell walls; atrophy and absorption are the natural consequences, and the boundaries being wholly or partially gone, or represented only by bands or bridges of membrane, the adjacent cells communicate, and the tumor assumes what is called the *multilocular* form.

This process of excavation may even go further, until all the cavities become continuous, or, with a total clearance of every partition, the cyst remains only one-chambered. It is but rarely, however, that we find a true ovarian cyst to be unilocular; more usually it is, what has been termed, paucilocular, if it be not multilocular.

These transformations are found taking place in some instances at an early period in some small tumors, while others of larger size preserve their multiple vesicular character intact. The nature of the contents of the several loculi varies almost indefinitely. Liquidity, consistence, color, and chemical composition may be different throughout. One cell may contain nearly solid matter, the next a limpid fluid; in one may be pus, in another serum, without any trace of cell formation. There is union in the mass, but no uniformity of action in the parts; and the growth having overstepped the bounds of healthy influences, comes to ultimate destruction by the irregular play of a series of morbid changes.

Although multiple in number they are nothing but agglomerations of simple cysts, and do not, collectively any more than singly, possess the distinctive property of the compound or proliferous cyst—that of self-multiplication by endogenous gemmation.

There are often discovered, in examinations of the ovary, cysts which bear no relation to Graafian follicles or corpora lutea, but which seem to have originated in the deep areolar tissue, or among the vessels of the gland. They may have commenced as tiny deposits of fluid in some one of the areolar spaces, about which condensation of the surrounding tissue would soon take place, with the speedy production of a limiting capsular membrane, channelled out with capillary vessels; or it is allowable to retreat a step further for explanation, and fall back upon the easily roused innate power of evolution of the plastic nuclei and cells of the tissue.

Proliferous Cysts.—Compound, composite, complex cysts, cystoma, cystoid or adenoid tumors, have a very different structure.

An ovarian adenoid proliferous tumor is a parent cyst filled with its progeny of endogenous cysts, or surrounded by others of exogenous growth. It may have the same origin as other cysts, and its early condition would be that of a common unilocular cyst. In fact, any epithelial cysts may become proliferous, and they are found in all parts of the body. But wherever they are they have, when filled up, the same complex appearance to a casual observer, and seem equally to defy description or comprehension.

When cut open, the interior is seen to be choked up with other cysts, growing from all sides, crowding and pressing each other out of shape. From the outside of these secondary cysts others grow, and the same outgrowth may be again repeated upon them. So, too, if these inner cysts are opened, another endogenous series may be disclosed within, and the budding does not necessarily stop there. Want of space and failing vitality only, either in the patient or the part, put an end to the process.

But proliferous cysts have degrees of fertility. Some breed to suicidal repletion; others fill with fluid and nourish a few clusters, or only a single symmetrical cluster, of secondary cells, which have room enough and to spare, and hang pendant in the cavity. Now and then only one solitary bud indicates the self-multiplying tendency of the parent cyst.

Their mode of development varies. The Graafian follicle is a proliferous cell, lined with epithelium. If injured or tainted by some morbid influence, the ovum is blasted; the vesicle then takes on a cystic form and enlarges.

Dr. Fox has shown that the first and most frequent manner in which secondary cysts are formed is the result of the production of a series of glandular structures, presenting a tubular type, on the inner wall of the parent cyst. Masses of glands thus imbedded are dilated into cysts by their own secretion, and form the small semi-solid masses which project into the interior of the parent cysts, and in them similar processes may be repeated indefinitely. Another process of secondary cyst formation is of a somewhat different character. The cysts in these cases give off diverticula, which expand at once into cysts which project into the interior of similar adjacent formations; or long tubular follicles are given off from the diverticula, portions of which become, by a series of successive constrictions, converted into cysts. The third class of cases are those where cysts are found associated with cauliflower growths, springing from the interior of the parent cysts.

Ovarian cysts are attached to the uterus by a pedicle formed of the broad ligament, Fallopian tube, ovarian ligament and vessels. which latter are sometimes very large. There are also lymphatics running into the cysts, as well as nerves. The pedicle varies in length and consistence, being sometimes long and slender, at others short and broad; sometimes it is tough and dense, in other instances being so fragile as hardly to admit of being secured by a ligature.

The Fallopian tube is often much elongated, the broad ligament

often considerably thickened, the utero-ovarian ligament occasionally hypertrophied into a large fibroid stem. The utero-ovarian ligament and the Fallopian tube are not invariably connected by the broad ligament; a considerable space may intervene between them, so that they appear as two pedicles to one tumor.

Ovarian cysts are covered by peritoneum. In the larger cysts the walls can be separated into two layers: the external consisting of tough fibrous tissue, with very few cells; the internal layer is softer, more fleshy-looking, and vascular, is composed of fine fibres, with an abundance of cells. The walls are highly vascular; the epithelial lining varies in character, from flattened polygonal cells to cylindrical cells.

When the fibrous inter-cystic structure grows rapidly, the thickness of the cyst wall being disproportionate to the contained fluid, the tumor is spoken of as being a *cysto-sarcoma* of the ovary. The more active the tendency to proliferation, especially if it present the character of round-cell sarcoma, and the further the departure from simplicity of organization, the greater the tendency towards malignancy.

When this form occurs it frequently affects both ovaries at the same time; and when adhesions take place with neighboring viscera, these tissues are apt to become involved. There is also a tendency for this form of growth to recur in the pedicle, or by metastatic deposits, when the tumor has been removed by operation.

From the isolated position of these tumors they can be removed without fear of recurrence if the operation be performed early enough, before adhesions have taken place.

The Contents.—In the simple unilocular cysts the fluid is generally perfectly clear, hyaline, colorless, pale yellow or straw-colored, thin and limpid, varying in specific gravity from 1007 to 1015, and in quantity from a few ounces to several pounds; as much as 160 lbs. having been drawn off from one cyst.

In the multilocular, and especially in the proliferous cysts, the contents are more viscid and gelatinous, often resembling a firm jelly or colloid material, which will not flow through even a large canula, or may even be semi-solid, almost friable and crumbling colloid.

The contents of the different cysts forming the same tumor may vary immensely in character.

Even in the perfectly clear fluid of simple cysts there may be considerable quantities of cholesterin crystals, which, after standing, form a glittering pellicle on the surface. Scales of epithelium are almost always found floating in these fluids. The color of the fluid varies from that of clear water to a turbid yellow-green, brown-red, or chocolate color, depending upon the admixture of blood or pus, which may be recent and pure, or old and undergoing changes,

As a rule, after tapping the fresh accumulation of fluid is thicker, more viscid, and of a darker color.

Chemically the contents have been divided into two classes—the

mucous and the albuminous (Eichwald). The mucous series consists of the material of colloid globules, mucin, colloid material, and mucous peptone. The albumen series consists of albumen (and fibrin), paralbumen, metalbumen, albumen peptone (fibrin peptone). The mucous series are soluble in mineral acids, never precipitated from their acid solutions by ferrocyanide of potassium, not usually precipitated by tannin, or by neutral metal salts, but are completely thrown down by basic lead salts. The albumen series are distinguished from the mucin series generally by their being precipitated from their solutions by tannin and neutral metal salts. The first three contain sulphur.

The solids usually found on microscopic examination are granules, globules of fat, granular cells, epithelial cells, crystals of cholesterolin, blood corpuscles, and disintegrated blood, pus cells and compound granular cells, or inflammatory globules of Gluge. Some of these are present in the contents of every ovarian cyst, but it is rarely that all are found together in one specimen. Of these bodies the most important is the granular cell, and it is almost invariably present.

Cutaneous Piliiferous, or Dermoid Cysts of the Ovary constitute a distinct class, though they may be found in combination with serous or colloid cysts, these latter being dependent upon the irritation produced by the former. They are frequently developed before puberty, and by many regarded as always congenital.

Pathology.—The cyst wall consists of two distinct layers, the inner one resembling skin in structure, being either smooth or uneven from circular elevations. The lining membrane is composed of thick layers of pavement-epithelium, the innermost of which are flattened and non-nucleated, while the deeper are round or polygonal in shape. Under this is a layer corresponding to the cutis, frequently having papillæ, though not arranged in parallel rows or regular groups. Next to this is a mass of looser areolar and adipose tissue, containing the usual tegumentary appendages, sebaceous and often sweat-glands, and hair follicles. In the areolar tissue beneath the skin formation, laminæ or spiculæ of bone are found, assuming when larger the most extraordinary irregular shapes, often occurring as lumps of dense compact substance having the true structure of bone, the Haversian canals and bone cells being arranged in lamellæ, though the canaliculi are less numerous. Occasionally these bony masses resemble distinct foetal bones.

Teeth, in some instances perfectly formed, but more generally rudimentary, are generally present. They arise either from bone, which in some instances resembles perfectly-formed alveoli, or from the stroma of the cyst wall.

The contents of dermoid cysts are generally of a greasy, pultaceous nature, consisting of free fat, cast-off epithelial cells, and cholesterolin crystals, which often give it a glistening appearance. Mixed with this we have tufts of hair, often collected in balls, and teeth, varying in number from a few to as many as three hundred. Brain substance, nerves, muscular fibres, and bone have also been

found. The cyst is usually single, at other times it seems to be divided into compartments by the growth of septa from its walls. The external covering is fibrous in structure.

Causation.—Various hypotheses have from time to time been started to explain the origin of these cysts. It was thought they might be the result of the imperfect development of an ovum, taking place either spontaneously or in consequence of impregnation, but they have a character quite distinct from that of extra-uterine fœtations, and form independently of spermatic influence, being found in young children, and even before birth, so that anatomists now generally agree that they are quite independent of conception. Another explanation suggested was that they arose from the early inclusion of an ovum which is imperfectly developed within another ovum which attains perfection. But the constant situation of these cysts in the ovary goes far to disprove this theory; such an ovum would be attached to some more external part.

The evidence against all theories which refer the origin to the development of an ovum under any circumstances is overwhelming. They have been found in other organs than those of generation, as the lungs, thyroid glands, kidneys, etc., and also occur in the proportion of about two-fifths in the male, the majority of these being in the testicle.

The view of the origin of these cysts now generally received is, that they are congenital, and due to a displacement of the external layer of the blastoderm. From this layer the epidermis and other structures are developed, and it is supposed that a portion of it becomes included in the part of the middle layer from which the ovary is formed, and forms the rudiments of cysts of a dermoid character (Williams).

Symptoms.—These differ in several respects from those met with in the case of ovarian cystomata. In the majority of cases probably the tumor commences in very early life, while formative energy is specially active, taking on a more active growth when the ovary becomes developed about puberty, their presence being then declared. Their rate of growth is slow, and they seldom attain a larger size than that of the adult head. They are hard and generally globular. There is generally only one tumor of one ovary. Fluctuation is generally indistinct, unless suppuration occur, or the accumulation of fat becomes excessive. They are very liable to undergo inflammation and suppuration from the pressure of the gravid uterus during pregnancy and parturition. They are apt to contract adhesions with the viscera among which they are imbedded, with the bladder or intestine, or even with the abdominal wall. Fistulous communications then occur, and the contents of the cyst become discharged, but seldom so perfectly as to ensure a cure. The tumor does not appreciably diminish in size, suppuration goes on, the signs of hectic or irritative fever set in, emaciation with exhaustion, and death ensuing, if means be not taken to obviate this termination. The cyst rarely ruptures into the peritoneal cavity.

Diagnosis.—Where a moderate-sized, slow-growing, semi-solid tumor is discovered about the age of puberty, that presents no evidence of fluctuation, but often of hard bony plates on the cyst wall, our suspicions as to the character of the tumor may well be excited. Care will, however, be requisite not to mistake an extra-uterine gestation cyst for a dermoid cyst. The frequency with which adhesions occur to surrounding organs in these latter, and the presence of bony plates, may mislead even the most wary. The history of possible pregnancy, and a careful consideration of all the symptoms, will alone enable us to distinguish them. Even when rupture of the cyst externally into the bladder or rectum has taken place, we may still be lead into error in imagining that we have an extra-uterine gestation to deal with. The escape of fatty matters, hair, teeth, or portions of bone, should at once enable us to clear up the diagnosis.

Treatment.—Should inflammation, or rapid enlargement of the tumor ensue, removal by ovariectomy should be advised before supuration has taken place, or the risk of rupture of the cyst has been incurred.

If evident pointing of the tumor towards the surface be detected, the skin becoming inflamed and tender, it will be well to make a small incision by means of a bistoury, and then carefully explore the cavity by the sound, finger, and hook, when if fat, hair, teeth, or bone be detected, the opening may be enlarged by means of a crucial incision, and the evacuation of the contents thus facilitated. The cavity of the cyst may then be washed out with some antiseptic fluid, a solution of iodine, Condy, or carbolic acid. If thought desirable, efforts may be made with a view to obtaining contraction of the cyst by lightly cauterizing the interior with the galvanic cautery, to modify its character, as suggested by Dr. Barnes.

Extirpation of the cyst may be attempted if the adhesions are not too extensive, but should these preclude removal, a counter-opening through the roof of the vagina may be made by the thermo-cautery, the contents of the cyst as far as practicable removed, and a drainage tube inserted, the cavity being washed out regularly with some antiseptic fluid.

Where the dermoid cyst is of moderate size, and wedged down in the pelvis by adhesions, an exploratory puncture with the aspirator trocar may be made, and the opening subsequently enlarged.

Fibroid Tumor of the Ovary. *Fibro-myoma; Fibroma.*—This is exceedingly rare. Tumors beginning in the uterus, overgrowing and involving the ovary so as to disguise its natural appearance or conceal it altogether, have not infrequently been mistaken, even after removal, for tumors of the ovary. Fibroid tumors consist chiefly of fibroid tissue, and appear to be due to hypertrophy of the stroma of the ovary. Muscular fibre-cells have also been discovered in them, but in small quantities only. Some of these growths, however, are not due to simple hypertrophy of the ovary, but are distinct nodules growing in the substance of the organ. Several such nodules may be agglomerated together and form one tumor. They

vary in density, some having a hard, uniformly dense structure, others containing smaller or larger loculi or cysts, while a third class possesses a loose vascular texture, and present a cancerous appearance (Williams).

True fibroid tumors of the ovary seldom attain a large size, rarely larger than a child's head. Although fibro-cystic ovarian tumors may attain an immense size, and there seems little doubt that much confusion has arisen between these separate forms, Dr. Barnes observes that in most of the presumed fibrous tumors the cystic cavities have been the most noticeable features. The cysts may be more or less obliterated by the hyperplastic condition of their walls.

These overgrown partitions are made up of a fibrous vascular mass, not in any way distinguishable from that usually seen in cyst walls. This kind of fibro-cystic tumor grows very rapidly, and has a strong hæmorrhagic disposition, causing in some cases effusion of blood into the cyst cavity. It appears then to be highly probable that most of the apparent fibrous tumors of the ovary differ from undoubted cystic tumors chiefly in the greater relative proportion of the fibrous walls and the lesser development of the cysts. Like fibroid tumors of the uterus they occasionally undergo a process of calcification. Far more serious changes, however, occur, for occasionally they become gangrenous, or break down and suppurate, forming fistulous communications with the vagina or elsewhere.

The pedicle may become twisted, thus producing congestion and softening of the tumor, leading to gangrene, or it may be so bruised and injured during parturition as to lead to suppuration or gangrene.

Diagnosis.—There is nothing very characteristic in the symptoms during the development of these growths. It is extremely difficult, if not impossible, to distinguish them from pedunculated fibroid tumor of the uterus. Their mobility or fixity may guide us slightly, but where, as not infrequently happens, they are impacted in the pelvis, even this fails us, and at best our diagnosis is purely conjectural. From cystic tumors they may be distinguished generally by their hardness and absence of fluctuation; from cancer by their slow growth, and more or less smooth surface.

Prognosis.—As a rule, fibroid tumors of the ovary grow slowly, and cause but little inconvenience, as they seldom attain to any very large size. They may, however, become impacted in the pelvis, thus obstructing the bladder and rectum, or interfere materially with parturition.

Treatment.—This will generally consist in relieving symptoms. Should the tumor become impacted in the pelvis, and cause obstruction, our first efforts should be directed to dislodging the tumor. The patient should be placed in the genu-pectoral position, and digital pressure made either *per rectum* or *per vaginam*, as in cases of impaction of the retroflexed gravid uterus.

Should these means fail in relieving the obstruction, the question of extirpation will present itself.

The operation of gastrotomy will generally be preferable to any attempts at removing the tumor by the vagina or rectum.

Where the tumor attains a considerable size, and interferes with the comfort or health of the patient by producing much pain or distress, its removal by gastrotomy will be advisable.

Cancer of the Ovary.—Carcinoma may occur, as in other organs of the body, either as a primary or secondary affection. Next to cystic disease, cancer is the most frequent disease of the ovary. It is frequently consecutive upon disease of the uterus and the pelvic and abdominal glands. Every kind of cancer infesting other organs is in turn reproduced in the ovary. The peculiarity of its tissues, and the arrangement of its component parts, perhaps in some respects facilitate the development of the disease. The fibrous stroma, the dense investment, the abundant groups of innocent reproductive vesicles, and the ever-growing intra-follicular epithelium, seem respectively typically to prefigure the forms of scirrhus, colloid, papillary, and medullary cancer (Wells).

The *encephaloid* form is one of the most frequent varieties. It may attain considerable size, forming a globular mass, with spheroidal knobby projections, diffuent in parts. In some cases it appears to have sprung up on the internal membrane of the Graafian vesicle, preserving an areolar or alveolar aspect, the centre being filled with blood, the result of internal hæmorrhage.

Scirrhus degeneration may be either primary or secondary. It is less commonly met with than the other varieties, occurs usually after middle life, and may create a tumor of large dimensions. It develops slowly, and presents the same physical appearance as noticed in other organs similarly affected. The ovary seems occupied by a nodulated mass of uniformly hard, heavy, white, and fibrous tissue; its toughness exceeds even that of the firmest fibrous tumor.

Melanosis almost always attacks the ovary secondarily.

Medullary carcinoma occurs, especially in young persons, as a primitive disease, and is also associated with cancer of the other organs as a part of a general wide-spread cancer formation. It may originate in the Graafian vesicles, in a corpus luteum, or in the stroma of the organ.

It is often symmetrical in size, and forms a distinct mass as large as a child's head. In some places it resembles in its firmness and the preponderance of its framework, the fibrous cancer; in others it is soft, very juicy, fluctuating, *encephaloid*. The tumor is sometimes free, but mostly united to surrounding structures by adhesion.

Medullary cancer may affect the cyst walls in the form of villous cancer, so completely invading the cyst walls in some cases as to make it appear that cystic degeneration had occurred secondarily to its deposit. The gelatinous cancer thus appears in the cystoid growths. Flat, rounded medullary knots, or villous cauliflower-like excrescences, appear on the inside of the cysts, growing until they fill the cavity. Distention sometimes causes rupture of the tunica albuginea of the ovary, and then exuberant medullary

growth develops in contact with the peritoneum and abdominal viscera, the whole cystoid formation becoming fixed in all directions, producing either a dangerous peritonitis or abundant abdominal dropsy. This cysto-carcinoma also often occurs symmetrically in both ovaries, more commonly so in the more mature periods of life. With this form of cancer colloid degeneration is often associated, when it constitutes that variety called alveolar cancer.

The frequent transition from the cystic tumor to *colloid cancer* suggests the suspicion that some forms at least, especially the proliferous, partake of the cancerous character. The history of pathological processes does not lend much confirmation to the hypothesis of the ready convertibility of one form of morbid product into another. So far then as analogical reasoning may be trusted, that which in its advanced stages is obviously cancer in the ovaries, is, as elsewhere, cancer *ab initio*. The strong innate disposition of the ovary to develop cystic formations may determine the frequent assumption by the original cancerous element of the cystic or alveolar form (Barnes).

Colloid cancer grows rapidly and to a large size, but does not quickly tend to destroy life by contaminating the system. It is a sort of intermediate form of disease, having intimate alliances and resemblances on the one hand with the innocent single cysts, and on the other often being intermingled and confused with the most rapidly spreading and malignant cancer growths.

In structure they consist of countless alveoli, often involving the whole ovarian structure, and acquiring a bulk equal to that of any of the cystic tumors, and filling up the pelvis and abdomen.

The contents are a tenacious viscid matter, varying in consistency from set-jelly solidity to a ropy, glairy stuff which may be drawn out into strings. It is seldom clear, often brown or yellowish, having mixed with it flocculent, whitish, creamy substance, and many epithelial cells, oil drops, and granular matter.

Diagnosis.—The symptoms pointing to the malignant character of an ovarian tumor have been summed up as follows by Thomas:

1. Rapid development of a solid tumor in an ovary.
2. Marked depreciation of the strength, vital forces, spirits, and general condition of the patient.
3. The occurrence of œdema pedum and spanæmia with a small tumor, which are consequently dependent upon a general blood-state, and not the results of pressure by the tumor.
4. Lancinating and burning pains through the tumor.
5. Cachectic appearance.
6. The occurrence of ascites without evidence of cirrhosis or other hepatic disease, organic disease of the kidneys or heart, or chronic peritonitis.

Treatment.—That cancer of the ovary preserves for a comparatively lengthened time its exclusive habitat in the ovary, before spreading to other parts, may be explained by the comparatively isolated terminal position of the ovary. As soon, therefore, as the

least suspicion of the nature of the tumor occurs, before it has become adherent, ovariectomy should be performed and the tumor removed.

Where patients do not present themselves sufficiently early in the progress of the case to allow of the removal of the tumor, adhesions being evidently so extensive, or the constitutional cachexia so marked, we can but treat symptoms, allaying pain by opium, relieving the ascitic distention by tapping with a very fine trocar and drawing off some of the fluid gradually, and promoting in every way euthanasia.

Tubercle of the ovary is exceedingly rare, except in association with tubercle elsewhere. Even when it occurs secondarily it is not generally until the whole system has become so infected that the idea of directing any special treatment to the ovary is out of the question.

Enchondromatous tumors of the ovary have been observed by Kiwisch in two cases, but are so extremely rare that it will be unnecessary to more than mention the possibility of their existence.

Extra-Ovarian Tumors.

It will be well to mention these in conjunction with ovarian cysts in order to facilitate diagnosis. They include:

Cysts of the Fallopian tube and terminal vesicle.

Cysts of the broad ligament, or vesicles of Wolffian body, and those developed from tubules of the parovarium.

Cysts developed from aberrant ova attached to the peritoneal surface.

Cysts of the Fallopian Tubes. *Hydro-salpinx, or Fallopian Dropsy.*—Distention of the tubes with fluid is occasionally met with in old people, both tubes being generally symmetrically affected. There is usually some preceding inflammation causing closure of both extremities of the tube; saccular dilatation then occurs from accumulation of secretion, and the outlets being closed, sacs of considerable size may form.

The cyst is not necessarily single, but may be subdivided by tight fibrinous bands, the product of peritonitis, encircling and constricting the tube at various points, throwing it into convolutions more or less tortuous in character. They seldom attain a size larger than the foetal head, though instances have been recorded of their growing to a much larger size, even having attained a capacity of eighteen pounds. The mucous membrane is changed in appearance, becoming smooth, or roughened by papillary vegetations from the submucous connective tissue.

The contents vary, being mucous, watery, purulent, or sanguineous.

Tubo-Ovarian Cysts are those whose walls are formed jointly by the tube and the ovarian stroma, the distended end of the Fallopian tube connected with and opening into a cavity within the ovary.

The ovarian portion of the cyst walls possesses either reticulated

or smooth, yellow, yellowish-red, or russet-colored lining-membrane, which does not continue into the tubal part of the cyst. It is seldom that the whole of the tube is involved, more generally the distal third is dilated, the junction of the tubal end with the rest of the cyst being marked by a slight constriction, or this may even be indistinct. These cysts occasionally pour their contents into the uterus along the Fallopian tubes, and then collapse. The fluid draining off through the cervix uteri and vagina has not infrequently been mistaken for urine, the patient being supposed to have had an ovarian tumor, which has either burst into the peritoneal cavity, the fluid being drained off by the kidneys, or has established a communication directly with the bladder, allowing the fluid from the cyst to pass off *per urethram*. The formation of these cysts is presumed to be as follows. The fimbriated extremity of the Fallopian tube grasping the ovary at the time of rupture of a Graafian follicle, in place of retracting, remains adherent to the ovary. Excessive secretion of fluid follows, and a cyst is formed.

Cysts of the Broad Ligaments are commonly either cysts arising from dilatation of the terminal bulb, or vesicles of the tube, or remains of the Wolffian body. They rarely exceed in size that of a pea or nut, though occasionally they become as large as an egg.

They usually have very thin walls, are covered by peritoneum, hang by a long slender pedicle, and contain clear watery fluid. They often burst and the contents escape into the cavity of the peritoneum, but the small quantity and innocent nature of the fluid causes little or no irritation, and seldom gives rise to any trouble. They are more often discovered *post-mortem*, and of more interest pathologically than clinically.

Parovarian Cysts constitute a more important class of cysts of the broad ligament. They are formed by distention of one of the tubules of the parovarium, or organ of Rosenmüller, a small body which is the relic of the ducts of the Wolffian body, situated between the folds of the broad ligament, between the outer extremity of the ovary and the Fallopian tube.

They usually occur in young women, are of slow growth, seldom attain any considerable size, although cases have been met with where the cyst was so large as to distend the abdomen. They cause comparatively little constitutional disturbance.

The cyst is almost invariably unilocular, though occasionally more than one tubule becomes dilated. The walls are usually very thin, so that fluctuation is generally very distinct and equal in all directions.

In some cases they are pedunculated, but are more likely to extend deeply between the layers of the broad ligament than in the case of true ovarian tumors.

The ovary is generally found separate and distinct from the cyst, the mes-ovarium being intact. The Fallopian tube is more likely to be flattened out over the cyst than in the case of a true ovarian cyst, and may even extend over the greater part of the circumference.

The cyst is lined internally by pale cylindrical nucleated epithe-

lium, corresponding with that found naturally in the tubules. The fluid contained in the cyst is limpid like water, generally of very low specific gravity, seldom above 1005, and contains only a trace of albumen, which is not, as a rule, precipitable by heat alone, but only by nitric acid.

These cysts are strictly simple and innocent in their nature, and are not likely to refill, should they be tapped, or from any accidental cause burst; hence a single tapping may be sufficient to cure the patient without exposing her to the risks of an operation for extirpation.

Where a cyst of small size, with apparently a very thin wall, occupies Douglas's pouch, puncture with the aspirator trocar through the vaginal roof should be resorted to.

Cysts from Development of Wandering Ova.—Instances have been recorded of simple cysts, perfectly unconnected with the ovary or its appendages, being found attached to the peritoneum. The supposition is that they were originally unimpregnated ova, which, on the bursting of the follicle, failed to reach the Fallopian tube, and falling into the peritoneal cavity, attached themselves to the peritoneum in a similar manner to that of the impregnated ovum in abdominal pregnancy. These aberrant ova undergo changes, acquire vascularity, and the nutritive energy being concentrated on the formation of tissue sufficient for cell walls and the exudation of fluid, the cyst may go on developing even to a considerable size.

Another form of extra-ovarian simple cyst has been described by Huguier under the title of "Serous Cysts on the Exterior of the Uterus." The seat of their development appears to be the tissue connecting the peritoneum to the uterus, and for the most part they are found on the back of that organ. They sometimes grow as large as an orange, but are commonly of insignificant size. The attachment to the uterus is broad compared with the bulk, but in some cases the cyst elongating acquires a distinct pedicle, and being freely mobile may easily be mistaken for a similar cyst arising from the broad ligament or ovary.

CHAPTER XX.

OVARIAN TUMORS, *continued*; INCLUDING THE DIAGNOSIS OF
ABDOMINAL TUMORS.

WE may now consider the causation, symptoms, course, and termination, diagnosis and treatment, of cystomata or cystic tumors of the ovary.

Causation.—As it is not until the tumor has attained some size that we are conscious of its existence, and cannot then determine how long it has been growing, it is almost impossible to say what has been the exciting cause. Observation proves that small cysts arising from the ovaries are by no means uncommon even in the fetal state, some authors asserting even that all cystomata have a congenital origin, and may remain in a more or less latent or passive condition until roused into active growth at puberty, or later, when the natural functional activity of the ovary comes into play.

Although the operation of ovariectomy for the removal of ovarian tumors has now been successfully performed in several thousands of cases, nothing positively certain or definite has been made out as to the probable cause of their occurrence. It has been thought that an insufficient menstrual hyperæmia of the ovary, as witnessed in cases of chlorosis and other forms of anæmia, may fail in producing rupture of the follicle: when in place of becoming atrophied, it undergoes cystic degeneration.

Again, any influences which keep up and intensify ovarian congestion, leading to fibrous hyperplasia of the ovary, or thickening of the capsule from ovaritis or pelvic peritonitis, may prevent the due maturation or rupture of the Graafian follicles, which then undergo cystic degeneration.

In some instances it seems probable that the development of the follicles too far from the surface to allow of their reaching it, may be the exciting cause of subsequent morbid action. Equally the premature death of the ovum may prevent maturation of the follicle, which, however, undergoes other changes, and may ultimately eventuate in some cyst-formation.

Inflammation affecting the wall of the vesicle may also exert an influence on the production of the disease.

It is, as a rule, during the period of most vigorous ovarian activity that the affection shows itself, nearly half the cases occurring between twenty and forty years of age. The exercise of the sexual functions does not predispose to ovarian cystic disease.

It has, however, been noticed that women who are the subject of ovarian cysts are less prolific than others, while many of them are absolutely sterile; this may be from the fact that in most cases

of this disease there is from the first the abnormal condition of the ovaries which accounts for the absolute or comparative sterility present, and which tends to develop cysts.

Symptoms.—These will vary, greatly depending upon the natural disposition of the patient and the character of the tumor. During the early period of development there may be little or no evidence of anything abnormal taking place until the tumor is manifest by its size. In other cases local discomfort is experienced from the first, such as pain in the ovarian region, which may assume the character of ovarian dysmenorrhœa. Whilst the tumor is still small and contained in the pelvis it may produce irritability of the bladder, with frequent desire to micturate, or even retention of urine from impaction of the tumor in the pelvis and pressure upon the neck of the bladder.

Should the tumor occupy the retro-uterine pouch, as is not infrequently the case, there may be pain in the back with a sense of weight or bearing-down in the pelvis, and aching pain extending down the thighs from pressure upon the nerves as they pass through the pelvis. The function of the rectum is usually more or less interfered with, there being irritation with a constant sense of discomfort as if the bowels were about to act, or constipation with tendency to hæmorrhoids. Should the tumor contract adhesions in the pelvis at an early stage, and thus be prevented rising into the abdomen as the growth enlarges, it may become impacted, and thus cause complete obstruction to the passage of fæces, necessitating operative interference.

The uterus is often displaced, thrust down, or to one or other side, retroverted or anteverted. Later on it becomes dragged up by its attachments, so that it cannot be reached by the finger on vaginal examination.

Its form is distorted and its functions often rendered difficult and painful, though not absolutely impossible, as pregnancy occasionally happens.

Menstruation may be regular and normal in character, though it is usually affected, in one way or another, from the commencement of the development of an ovarian tumor.

At first there may be menorrhagia, but generally menstruation becomes scanty and may ultimately cease entirely. Dysmenorrhœa is not infrequent. Even though both ovaries are invaded by the morbid action, it is seldom that the proper structure of both is entirely destroyed, and if only as much of one ovary as pertains to one mature vesicle remains sound, conception may take place. Pregnancy may then advance to full term, and delivery be accomplished without accident, or abortion or premature labor may be induced by the pressure of the tumor. During pregnancy the tumor may become twisted on its axis, inflammation of the cyst, hæmorrhage, or even gangrene resulting, or it may burst and cause death by peritonitis.

During labor the tumor may impede delivery, causing either rupture of the uterus or of the ovarian cyst.

Symptoms of pregnancy occasionally arise when no such condition is present. There may be amenorrhœa, morning sickness, swelling of the breasts with the characteristic symptoms of enlargement and discoloration of the areolæ and development of the glandular follicles, gradually increasing size of the abdomen, and other well-marked evidence of utero-gestation.

After the tumor has attained a large size, or has been of long standing, the breasts usually become flaccid and shrunken.

When the tumor first rises out of the pelvis into the abdomen, it is generally more to one side than in the centre. The pelvic symptoms are now relieved, unless adhesions had previously taken place, when from the dragging and other discomfort the distress is aggravated. In some instances a certain amount of peritonitis is set up, often local in character and assuming a latent course, but still producing some pain or tenderness. As the tumor increases in size it generally becomes more central, gradually rising above the umbilicus until it occupies the whole of the abdominal cavity.

The symptoms are now mainly those of pressure. There is a sense of fulness or distention, dyspnœa on exertion, aching in the loins, gradually increasing sense of feebleness, and emaciation begins to show itself. Occasionally there is pain extending down one leg from pressure on the nerves, and œdema from the venous circulation being interfered with; later on both legs suffer.

As the tumor goes on increasing in size, the abdomen becomes still larger, the superficial veins in the abdominal walls become enlarged owing to the obstruction to the return of blood by the common iliac veins: lineæ albicantes appear from the stretching of the abdominal walls; the stomach and intestines, crowded out of their natural position and subject to increasing pressure, have their functions seriously interfered with; digestive and intestinal disorders show themselves, vomiting, constipation or diarrhœa, anorexia, and other similar symptoms being generally present.

Dr. Atlee regards pulsation of the abdominal aorta felt through the mass as pathognomonic of ovarian tumor.

With increasing size the thorax at length becomes implicated. The diaphragm and heart are pushed up, the lower ribs spread out and more or less fixed. The lungs being compressed and the heart's action interfered with, palpitation, dyspnœa, and imperfect aeration of the blood result. Pressure upon the kidneys and the renal vessels produces congestion of these organs; scanty secretion is the natural result, and albuminuria is not infrequent. Where extensive pelvic adhesions occur, there is often also pressure upon the ureters with consequent damage to the kidneys; œdema of the abdominal walls and loins may be present: ascites from occasional attacks of peritonitis is also common. With the gradually augmenting size of the tumor we have progressive emaciation of the body occurring; it is more noticeable generally in the face, neck, chest, and arms. The features are chiselled out into the peculiar pinched expression which has been described as the *facies uterina*,

but which would probably be better named *facies ovariana*. It has thus been described by Mr. Spencer Wells: The emaciation, the prominent or almost uncovered muscles and bones, the expression of anxiety and suffering, the furrowed forehead, the sunken eyes, the open, sharply-defined nostrils, the long compressed lips, the depressed angles of the mouth, and the deep wrinkles curving round these angles form together a face which is strikingly characteristic.

In the latter stage a low type of gastritis, marked by intensely red tongue, aphthous stomatitis, vomiting, and tenderness over the epigastrium, is not infrequent.

Death at length supervenes, often being preceded by intense distress.

The distress, however, occasioned by ovarian tumors is not always determined by the size of the tumor; it appears earlier, and is more decided in cases of compound than in those of simple cysts, and is often dependent upon individual idiosyncrasy. Pain in the back or iliac regions may occur from tension of the Fallopian tubes and the broad ligaments.

Course and Terminations.—The natural course of ovarian cystic tumors is to go on gradually, or in some cases rapidly, increasing in size until they fill not only the abdominal cavity, the walls of which they greatly distend, but also encroach upon the thoracic cavity, pressing up the abdominal viscera, interfering with the action of the diaphragm, impeding respiration, and also the circulation by pressure upon the aorta and vena cava. The intestines are generally driven backwards and upwards; the capacity of the stomach is so interfered with and the pressure upon the abdominal viscera so great as seriously to affect the process of nutrition. The patient thus becomes emaciated; there is gradual failure, first of one power then of another, until at length she dies from exhaustion.

The rate of growth or natural duration of ovarian cysts depend upon the age of the patient, nature of the tumor, and other circumstances. The simple cysts may go on steadily increasing for some two to three years without interfering with the three important functions of respiration, circulation, and nutrition sufficiently to produce a fatal result. But the early growth of an ovarian cyst may be very slow; it may remain quiescent for a time, or may cease suddenly and finally to grow. The partly solid non-malignant tumors often grow very slowly, so slowly, indeed, that the system adapts itself to the gradual change, and a fatal result is thus postponed, often for many years. Instances are on record of ovarian tumors being present for twenty to thirty years.

The proliferous cysts and malignant tumors grow more rapidly. It is then often more a question of months than years.

There are, however, many contingencies that may happen in the course of an ovarian tumor, and these we will mention seriatim.

Small ovarian tumors becoming impacted in the pelvis may push the uterus forwards against the neck of the bladder, and so cau-

retention of urine. They may also cause such an amount of pressure upon the rectum as to produce obstruction to the passage of feces which may even terminate fatally. Again, the cyst may, from accident or injury, become the seat of inflammation, leading to suppuration of the cyst, peritonitis resulting and death ensuing in consequence. Instances have been recorded of tumors coming down before the head in labor, rupturing the vagina, and becoming protruded externally. The tumor has been known to escape, by bursting or perforation of Douglas's sac, through the rectum, the tumor being removed and the patient recovering.

Whenever a small ovarian tumor complicates pregnancy, it is liable to interfere with delivery by occupying the pelvic cavity and preventing the descent of the head.

Spontaneous cures of ovarian cysts. Cases of supposed spontaneous resorption of the fluid, with subsequent shrivelling of the cyst and cure, have been recorded, but it is more than doubtful whether they can be regarded as authentic. There has been some error in diagnosis. Cases have unquestionably occurred in which considerable accumulations, believed to be in ovarian cysts, have disappeared more or less completely, either spontaneously or under the influence of diuretic and other medicines, but so long as the fluid is confined in the ovarian cyst, it is beyond the influence of absorption. Dr. Barnes suggests in explanation that the fluid escapes first into the peritoneal cavity by rupture or a small perforation, and then becomes absorbed, or else by a fistulous channel directly into the bowel, and so becomes discharged.

It may have been a pseudo-cyst, or even ascitic fluid.

Bursting of the tumor into the peritoneal cavity, with absorption of the fluid into the general circulation and its rapid discharge by the excreting organs, may occur. Numerous cases are on record of the spontaneous or accidental bursting of ovarian cysts, followed by cure in this way. Where the walls are thin and tense, the simultaneous growth of the pregnant uterus, with its consequent pressure, under sudden exertion, direct violence, or concussion from a fall, may cause rupture of the cyst.

Recovery is not always, however, complete. The tumor may form again, the rent cicatrizing. More frequently the patient dies rapidly from shock, or from subsequent peritonitis, if she rallies from the shock. This will depend upon the nature of the fluid. If clear and watery it may cause little irritation, but where it is puriform or gelatinous it possesses acrid and irritating properties, and sets up peritonitis which may prove fatal. Even should this not prove so, the ovarian disease will pursue its natural course notwithstanding.

When rupture occurs, vessels are often torn, and large quantities of blood may be effused along with the ovarian fluid. This complication increases the danger of peritonitis, and adds that of hæmia.

Twisting of the Pedicle from rotation of the cyst on its axis, in cases where the cyst is free from adhesions, may occur from the

gravid uterus tilting it over, or from any sudden exertion. The pedicle thus becomes strangulated or partially so. Should the interference with the circulation be only sufficient to produce gradual atrophy, a cure may result. Evidence of this has been occasionally found *post-mortem*. The tumor may either shrink without being detached, or may be completely separated from its attachment and be found lying loose in the abdomen. In other cases the blood-vessels being unable to return the blood from the tumor, they become congested and burst.

Hæmorrhage into the cyst, causing sudden distention and producing symptoms of shock and anæmia, may prove rapidly fatal without rupture of the cyst or hæmorrhage into the peritoneal cavity, which, however, not infrequently occurs. If the patient survive the more immediate danger from shock, hæmorrhage, and peritonitis, the strangulation of the tumor is almost certain to lead to *gangrene*, and death from septicæmia if the tumor be not removed by gastrotomy, but even then the chances of saving the patient are slight.

The pedicle may give way spontaneously, and the tumor float in the abdominal cavity, or become attached to some other part and continue to grow, its vitality being maintained through the medium of vascular adhesions.

Bleeding from the surface of the cyst or into its interior may take place spontaneously from papillary growths, without the occurrence of rupture, or twisting of the pedicle. The blood may escape through the Fallopian tube and uterus; may collect in the retro-uterine pouch, constituting a hæmatocele; or it may remain diffused in the peritoneal cavity and cause fatal peritonitis. Death may occur rapidly, as in cases of rupture of an extra-uterine gestation cyst.

Inflammation in the interior of the cysts occasionally happens. It may be in consequence of injury or from tapping, or apparently without any assignable cause. Where the cyst is multilocular the inflammation may be limited to one or more of the cysts, the others remaining unaffected. Suppuration, and the formation of pus or of a foul and offensive fluid, generally ensues. This may become absorbed and give rise to pyæmia or septicæmia which proves fatal. Perforation of the cyst and discharge of the decomposing fluid into the peritoneal cavity may take place and cause death by shock or by intense general peritonitis.

Adhesions to the adjacent organs and tissues not infrequently occur during the progress of ovarian tumors, especially to the omentum and abdominal walls, but occasionally also to the intestines, bladder, pelvis, and even the liver and stomach. A coil of intestine may be found running over the anterior surface of the tumor, to which it is firmly adherent. As the tumor enlarges, the intestine becomes pressed upon so much as to cause obstruction stercoraceous vomiting sets in, and the patient succumbs.

The cyst may contract adhesions with the bladder, bowel, vagina or Fallopian tubes, and by bursting or ulcerative perforation into

one of these viscera, its contents may be discharged. When an opening forms from the intestine into the cyst, the contents of the bowel may enter its cavity and give rise to fæcal abscess which terminates fatally.

Perforation may occur from a wearing through of the cyst wall by partial pressure of the growths from within a papillary cystoma, or by suppuration. It is a gradual process, and more likely to occur in the glandular cystomas than in the simple cysts. Minute perforations between the cyst and the peritoneum not infrequently occur; the opening is at once glued up by plastic adhesion, thus limiting effusion and causing merely local peritonitis.

Occasionally adhesions form to the diaphragm, and the ulcerative process, continuing in an upward direction, the pleura and lung may be attacked.

Intercurrent attacks of peritonitis are common in the progress of ovarian tumors, apart from bursting or perforation. They may prove fatal, but more usually recovery takes place, and the surface of the tumor may then become completely adherent to all the surrounding parts.

Atrophic involution seems in some cases to occur. The nutrition and growth become impaired. The tumor may remain quiescent for many years, or be found, *post-mortem*, shrunk and degenerated.

The growth of an ovarian cyst is sometimes also, though very rarely, arrested by a so-called ossification of its walls, or rather calcification, no true bone being formed.

Methods in which death is produced. Terminations:

By *exhaustion* arising from inanition, due to pressure upon the stomach and alimentary canal.

By *asphyxia*, from pressure on the diaphragm, fixity of the chest and compression of the lungs; respiration and aëration are interfered with, pulmonary congestion supervenes, and bronchitis or pneumonia prove rapidly fatal from any slight exposure to cold.

By *collapse or shock*, from the extreme distention interfering with the heart's action, from sudden bursting of the cyst into the peritoneal cavity, or from hæmorrhage.

By *septicæmia* or *pyæmia*, from twisting or rupture of the pedicle, or from inflammation of the cyst and decomposition of its contents, especially if pregnancy complicate the case.

By *peritonitis*, intercurrent, or in consequence of rupture of the cyst, especially in cases of polycysts.

By *intestinal obstruction* from adhesions, or pressure.

Diagnosis.—If attention has been given to the foregoing symptoms there should be little difficulty in arriving at a conclusion as to the existence or otherwise of an ovarian tumor. The history of gradual enlargement of the abdomen, commencing low down to one or other side, the tumor not being tender on pressure, easily displaced, causing little or no inconvenience until it became bulky, extending above the umbilicus; the general health, good at first, gradually becoming impaired; the abdominal veins becoming enlarged; the altered expression of the countenance; the gradual

emaciation of the upper portion of the body; the diminution of the urine; the œdema of the extremities and other symptoms of deranged functions, form a characteristic group.

The local signs elicited by inspection, palpation, and percussion show the existence of a tense, elastic tumor, dull on percussion, fluctuating, separate from the uterus.

As these symptoms and signs will be more fully discussed in considering the differential diagnosis, it will be needless to enter more fully into them at present.

Differential Diagnosis.—When we state that the abdomen has repeatedly been opened with a view to performing ovariectomy, when not only no ovarian but no other tumor was present; that the pregnant uterus, nearly at full term, has been tapped with a trocar with the intention of drawing off ovarian fluid, and even been opened after abdominal incision before the mistake was discovered; that the chastity of virgins has been impugned by the assertion of their medical attendants that pregnancy existed; and that numerous and frequent mistakes are made in attempting to decide upon the character of abdominal tumors, we have said sufficient to show that the question of diagnosis in these cases is often one of serious difficulty and anxiety to the practitioner.

Fortunately it is not always so; some cases are so simple as to be recognized almost instinctively, others cause much greater difficulty, and in some cases it is simply impossible to arrive at any conclusion except on making an exploratory incision, and even then it may be impossible to determine the nature of the growth.

The diagnosis not infrequently involves the decision between life and death, for if we leave a patient to die unrelieved from not being able to make out the character of the tumor, when it is subsequently discovered that an operation might have been performed with success, or if we attempt to operate upon a patient, exposing her to all the risks of a formidable operation when no tumor exists or even one unfitted for operative interference, in either case we incur a grave responsibility.

It will be well then in every case, no matter how simple apparently it may at first sight appear to be, to examine the patient thoroughly and systematically. We must employ every faculty available: sight, touch, hearing; aiming rather at making a thoroughly reliable and trustworthy, than a brilliant, showy diagnosis, arrived at often too hastily, and regretted at leisure. The examination should be pursued systematically. Having made out the history of the case so far as it is likely to throw light upon the question at issue, and ascertained that some abdominal complication exists, the patient should be requested to loosen her dress—unfastening everything that surrounds the waist, remove her stays, and then lie on her back on the couch, her shoulders being slightly elevated, the knees drawn up, and the abdomen uncovered.

Where possible, it should always be arranged that the bladder be emptied and the rectum unloaded before the examination be made.

Should the patient, from nervousness or from any wish to de-

ceive and mislead us, or from tenderness preventing careful exploration, hold the abdominal muscles so tense as to preclude our making a satisfactory examination, some anæsthetic must be given and a full investigation carried out. This should never be done hurriedly at the time by the practitioner alone; a second person should always be present in the room, and, if possible, the anæsthetic administered by another medical man, whose opinion also might prove of value. It is comparatively seldom that it will be found requisite to administer an anæsthetic, but in cases of phantom tumor or spurious pregnancy, which are specially liable to mislead the practitioner, a double advantage is gained, in that a thorough examination is facilitated, and the tumor also dispersed.

More errors in diagnosis are made from too hasty conclusions from imperfect data than would be believed. It is not sufficient to see that the abdomen is enlarged to decide that a tumor is present, nor to feel that the abdomen is distended. Unless percussion and auscultation are systematically employed, we shall be continually arriving at wrong conclusions.

When it is remembered that the diagnosis of ovarian tumors involves the analysis of every enlargement possible to occur in the abdomen, the practitioner should not be in too great a hurry to arrive at a decision as to the character of any individual tumor. We shall on this account enter somewhat fully into the subject, and endeavor to make it as clear as possible.

Our first object, then, will be to discover whether any abdominal tumor exists, and if so, our next, what is the character of the tumor or swelling.

Having uncovered the abdomen sufficiently to command a fair view, we then bring into play our faculty of sight by

Inspection.—Note carefully the size, whether enlarged or fairly normal; the shape, whether symmetrical or otherwise, arched and prominent or flat and bulging in flanks, whether there is any alteration of shape on sitting up, or any irregularities, as met with from distended coils of intestines. Note also the condition of the skin, whether healthy and normal in appearance, or œdematous, marked with lineæ albicantes or discoloration.

Mensuration should always be employed to give more precision to what may have been detected by the eye, and also as a record of any alteration in size from time to time.

Having ascertained all that we can in this way, then proceed to bring another sense to bear upon the question, that of touch by

Palpation.—With the outspread hands applied to the abdomen, note whether it be soft and resilient, hard and tense; whether the hand can be pressed down towards the spine or encounters resistance from some cystic or solid tumor. If so, determine the size, shape, evenness or inequality of surface, presence of fluctuation, pain or tenderness on pressure, evidence of movement as in uterogestation.

Per vaginam ascertain if the uterus be normal in position, size, consistence; if the finger can detect any tense cyst wall at the roof

of the vagina to which impulse is communicated from above by conjoined manipulation.

Should the case seem to require it, examine *per rectum* as well.

Then bring the faculty of hearing into play by means of

Percussion.—Note whether the abdomen be resonant or dull, the area of dulness in front or more laterally; whether, if dulness be detected, the line of dulness alters on change of position.

The sense of hearing may still further be made use of by means of

Auscultation, either with the ear direct, a soft towel being placed over the abdomen, or with the stethoscope.

Notice whether borborygmi, placental bruit, foetal heart-sounds, etc., can be heard.

The examination thus far conducted should enable us to say whether the abdomen is abnormally enlarged, and, if so, whether from distention with air or fluid, or from the presence of a tumor, fluid or solid, or from a combination of any of these conditions.

Where an accumulation of fluid is detected in the abdomen, either free or encysted, other means at our disposal are: aspirating a small quantity of fluid by the hypodermic syringe, or an ordinary aspirator and trocar, or by paracentesis and examination of the fluid under the microscope and by chemical tests. An exploratory incision may also be rendered requisite to clear up a diagnosis.

The abdomen may be considerably enlarged from obesity with tympanitic distention, hysterical tympanites, phantom tumors, spurious pregnancy.

Obesity with Tympanitic Distention occurs not infrequently towards the menopause, especially in sterile women. The obesity is rarely limited to the abdomen and breasts, but occurs in the face and extremities as well.

Although large, the breasts are doughy, and have neither the characteristic feel of physiologically active glands, nor is there any increase in the area and darkening of the areolæ as met with in utero-gestation. Pregnancy and obesity seldom concur, and speaking generally, the subjects of ovarian tumor are mostly slim and slightly built.

On *inspection* of the abdomen it is seen to be more or less symmetrically enlarged. On making the patient sit up the abdominal walls are thrown into pendulous folds, the umbilicus is hollow and depressed.

On *palpation* the abdominal enlargement is felt to be doughy, yielding on firm pressure. There is no sensation of a well-defined globular tumor with resisting outline, giving the peculiar feeling of a wavy or living impulse under the hand as marks the peristaltic movement of the uterine wall, or the movements of the foetus in pregnancy. The abdominal walls may be pinched up between the two hands, lifted as it were and made to roll over the muscular floor beneath.

If anæsthesia be produced, the hand can be made to sink almost to the spine, making due allowance for the thickness of the abdominal walls.

On vaginal examination the uterus is probably found normal in size, central, mobile; the cervix not softened, as in true pregnancy, and directed backwards, but hard and central, often low down.

There is no displacement of the uterus, with tilting to one side or dragging upwards, as met with in ovarian tumor.

On conjoined manipulation with firm pressure the uterus can generally be felt of normal size, not enlarging out uniformly as in pregnancy, nor is there any sensation of a cyst in front of the uterus as met with in ovarian tumors.

On *percussion* obscure resonance over the whole abdomen is generally detected. If firm pressure be made over the lower portion between the umbilicus and pubes, where the enlarged uterus would be if pregnancy existed, or where an ovarian cyst would be most likely to be found, and percussion so as to get out the deep note be resorted to, the resonance is even more marked than it is superficially.

On *auscultation* the rolling and rumbling of confined air in the intestines, so-called borborygmi, is essentially different from the placental bruit and foetal heart-sounds of utero-gestation, or the complete absence of any sound as noticed in ovarian tumors.

Hysterical Tympanites, Phantom Tumors, and Spurious Pregnancy may practically be considered together to obviate confusion, since the actual physical condition is almost identical in each. The same systematic method of investigation must be followed as just indicated. The abdomen is often uniformly distended to the size of the pregnant uterus at full term. It is rounded, hard, and resistant. The apparent enlargement is often increased by arching of the back, either involuntarily or at will, the recti muscles being held tense, so that no impression is made upon it by pressure of the hand. Change of position causes no alteration in shape.

On percussion the abdomen is uniformly resonant. If the patient's attention can be diverted by engaging her in conversation, or if she be placed under the influence of anæsthesia, the swelling entirely disappears, the hand can be pressed down to the spine, the abdomen becomes flaccid. There is no fluctuation or any solid tumor present.

In these cases but little dependence can be placed on the subjective symptoms, the patient often being very hysterical, occasionally the subject of delusion amounting almost to monomania, in other cases merely of a natural mistake.

In cases of spurious pregnancy, in addition to the above physical signs, the mammary signs of pregnancy are often entirely absent. The catamenia in young women are often regular, though this fact may be suppressed. At the time of the menopause the cessation of the catamenia in due course may really prove to have been the starting-point of the delusion as to the existence of pregnancy. On vaginal examination the uterus, in place of being enlarged, is found to be more or less normal in size, mobile; the cervix of natural density, not softened; the os uteri normal.

In place, however, of being resonant on percussion, we find the abdomen is dull, and there is a more or less distinct sense of fluc-

tuation. The two conditions most likely to account for this are an ovarian cyst and ascites, and as it is of great importance to distinguish these two, the leading points of difference are here tabulated for comparison.

The mere fact that no fluctuation can be detected must not always be accepted as proof of the non-existence of fluid, without further investigation. Fluctuation may be rendered very indistinct, or may be entirely prevented, though fluid be present, by the following causes (Peaslee):

1. Great thickness of the abdominal walls, from fat or œdema, whether the fluid be in the peritoneal cavity or in a cyst.
2. Great thickness of the walls of a cyst, they being, in dermoid tumors and polycysts, sometimes 1 to 1½ inch thick.
3. Great tenseness of the cyst, even though it be a large one.
4. Great density of the fluid, as in colloid cysts.
5. Small amount of fluid in each cyst, as in many polycysts.

Ovarian Cyst.

History.—General health good at time of discovery of enlargement in abdomen; fails gradually and slowly.

Catamenia often regular, though scanty.

Hydragogues and diuretics produce no effect as a rule.

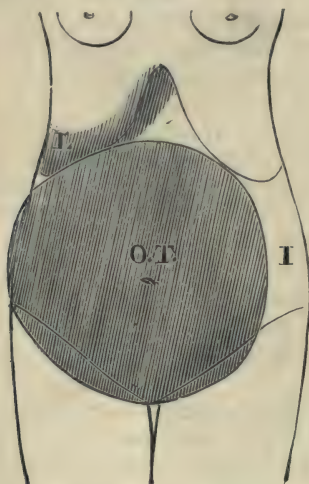
Ascites.

Health failing often before swelling noticed, often rapidly.

Often irregular, profuse, or scanty.

Hydragogues and diuretics produce temporary relief.

FIG. 120.

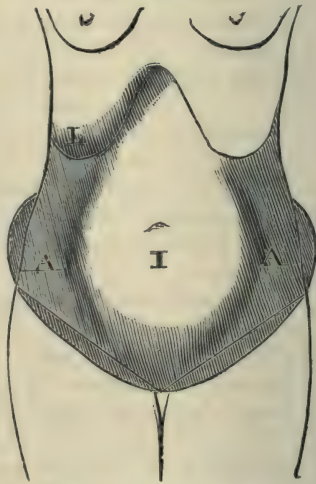


Ovarian Tumor. Dorsal Decubitus. (After BARNES.) O. T. Dull area of Ovarian Tumor. I. Intestinal resonance. L. Liver.

No evidence of cardiac, renal, or hepatic disease as a rule.

Tumor often first noticed to one side of abdomen, becoming more central further on.

FIG. 121.



Ascites. Dorsal Decubitus. (After BARNES.) A. Ascitic dullness. I. Intestinal resonance. L. Liver.

Generally evidence of organic mischief in one or other of these organs, or of peritonitis.

Swelling first noticed as a fulness or bulging in the lower abdomen on standing.

Ovarian Cyst.

Œdema of face, hands, feet, etc., seldom present until a late period.

On Inspection.—Abdomen enlarged, bulging in front, arched, often more to one side than another, changing but little if at all in shape on change of posture.

Umbilicus never prominent, or bulging, or thinned; on deep inspiration upper part of cyst often seen to rise and fall.

Greatest circular measurement often some inches below level of umbilicus.

Abdominal integuments normal, or merely thinned.

Chest conical from bulging of false ribs.

In advanced cases the characteristic *facies ovariana* is generally marked.

On Palpation.—Abdominal walls tense, resisting pressure.

Ascites.

Generally present early in the case; œdema of extremities in all cases.

Uniformly enlarged, flattened in front, bulging in the flanks. Shape of abdomen alters materially on change of posture, the fluid bagging to the lower part on sitting or standing.

Umbilicus often prominent or bulging, and thinned. Not so; occasionally simulated by distended coils of intestine, but these are resonant on percussion.

At level of umbilicus.

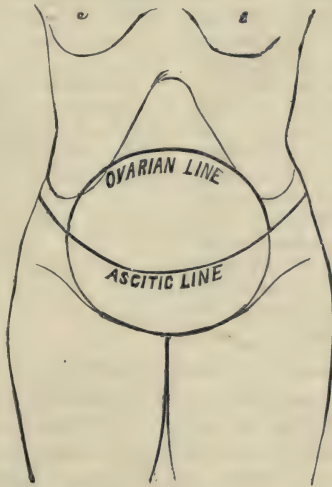
Skin of abdomen smooth, tense, shining.

Floating ribs not bulging.

Cachectic appearance often marked from the first.

Soft and resilient if amount of fluid moderate, tense when excessive.

FIG. 122.



Differential Characters of Ovarian and Ascitic Dropsies in upright posture. (After BARNES.)

Fluctuation usually most distinct in centre of abdomen, superficially; does not vary with position of patient; limited to line of dulness; more distinct in recumbent position.

Aortic pulsations transmitted through the cyst to the abdominal wall.

Per Vaginem.—Cyst often detected at pelvic brim or vaginal roof in front of uterus, impulse being communicated from above. Fluctuation often indistinct, or not felt in case of polycysts.

Most marked in most dependent parts, in the flanks on lying down; less marked anteriorly; varies with position of patient; felt beyond line of dulness, diffused through abdomen; more distinct in erect position.

Aortic pulsation not felt through abdominal wall.

No cyst felt; no impulse communicated; sense of bulging; fluctuation often detected.

Ovarian Cyst.

Uterus generally drawn upwards or tilted to one side; mobility often impaired; cervix shortened; uterus generally displaced behind the cyst.

On Percussion. — Dulness is most marked over centre of abdomen; line of dulness in the erect posture is convex; one or both flanks resonant.

Areas of dulness and resonance remain the same on change of posture if the cyst be of large size. A moderate-sized cyst may move somewhat from side to side when the patient turns over.

On Auscultation. — Nothing heard over seat of tumor except, possibly, the aortic pulsation is transmitted. The fluctuation wave of fluid may be heard on succussion.

Character of Fluid. — Fluid usually amber-colored, somewhat viscid, sticky to the feel, often like syrup; sp. gr. 1018–24; varies in color in different cysts; contains no fibrin, but albumen, paralbumen, metalbumen, and peptone.

Never coagulates spontaneously.

Microscopically. — Cylindrical epithelium, cholesterol, leucocytes, and granular masses are found. The characteristic granular ovarian cell contains a number of fine granules, but no nucleus, and is distinguished from other cells by becoming more transparent and its granules more distinct on the addition of acetic acid. It remains unaltered on the addition of ether. No amœboid corpuscles present.

We have here for sake of clearness indicated the leading points of distinction in the two conditions. It must be remembered, though, that numerous complications may vitiate these conclusions and lead to fallacies. Thus ovarian tumors, especially if malignant in character, may be associated with ascites, when the flanks will be dull, and the areas of resonance and dulness change when the position be altered. There may be gaseous distention of the large intestine in cases of ascites, and thus resonance in either flank be present in place of dulness, especially in the right, where the ascending colon is more bound down by adhesions. Where the abdominal distention from ascites is very great, the mesentery may be too short to allow the intestines to float to the surface, or they may be bound down by adhesions, the result of peritonitis, and thus more or less uniform dulness be the result. On careful auscultation, however, in these cases the movement of flatus in the intestine may usually be heard on deep pressure over the centre of the abdomen, this not being the case in ovarian tumors of such a size. Again, the an-

Ascites.

Uterus either low down and movable, or normal in position; cervix of normal length.

Dulness in both flanks when lying on the back; resonant anteriorly in the most elevated parts; line of dulness on sitting or standing concave.

Alter according to the position of patient; on side, upper flank resonant; on sitting up, fluid gravitates to lower part of abdomen, the dependent parts being dull, the uppermost resonant. Exceptions occur when intestines bound down by adhesions, or when fluid excessive in quantity.

Gurgling sounds of intestines over centre of abdomen, movement of fluid heard on succussion; no aortic pulsation transmitted.

Limpid, light straw color, highly albuminous; sp. gr. 1010–15; deposits fibrin spontaneously as a delicate film, but no sediment; does not contain paralbumen, metalbumen, or cholesterol.

Coagulates spontaneously.

Squamous epithelium cells, leucocytes, and fibrin, with occasionally pus cells; oil globules and amœboid bodies are found.

terior surface of the abdomen may be resonant in cases of ovarian tumor where the cyst contains air as a result of tapping, or of a communication with the intestine. We may have pregnancy or other tumor associated with ascites, this latter condition being so considerable that the presence of the tumor is masked or not discoverable.

Differential Diagnosis of the Three Varieties of Ovarian Cyst (Peaslee).

<i>Monocyst and Oligocyst.</i>	<i>Polycyst.</i>	<i>Dermoid Cyst.</i>
Slower growth; not uncommon.	Rapid growth; more common.	Congenital; very slow, very rare.
A peculiar expression comes later.	Comes much earlier.	Latest of all.
General health fails much later.	Fails early.	Very late.
Abdomen symmetrical.	Not symmetrical.	Not symmetrical.
Enlargement from 35 to 45 inches.	Sometimes to 55 or even 78 inches.	Smallest; generally 30 to 40 inches.
Surface smooth if monocyst.	Lobulated, irregular.	A monocyst as a rule.
Tumor disappears after tapping.	Does not disappear.	Does not completely collapse.
Edema of lower extremities very rare; abdominal veins less enlarged, and later.	Very common; veins enlarged early.	Very uncommon.
Adhesions less common and less firm.	Adhesions the rule, and vascular.	Adhesions not very rare.
Inflammation of cyst wall not common.	Not so common.	Most uncommon, proportionally.
Ulceration of cyst wall not common.	More common.	Most common of all.
Spontaneous rupture not common.	Far more common.	Very uncommon.
Amenorrhœa comes later.	Comes much earlier.	Very late.
Fluctuation distinct and throughout, if a monocyst, and from any point to all others.	Less distinct and circumscribed.	Fluctuation more obscure.
<i>Per Vaginem.</i> —Uterus is higher, and the fluctuation also.	Uterus is lower, and the fluctuation also, or none at all.	Uterus lower, fluctuation dull.
Pedicle longer as a rule.	Shorter as a rule.	No rule.
Fluid limpid, amber, bluish or greenish, viscid, with much albumen.	Not clear; brownish, dense, gelatinous, or albuminous.	Light color, curdy, no albumen; partly soluble in ether.
Contains epithelial scales, cholesterin, and fatty granules, and the ovarian glomeruli.	Contains also blood pigment and blood corpuscles.	Contains epithelial scales, sebaceous matter, crystals of cholesterin, hairs, teeth, bone, etc.

Parovarian Cysts.—*Cysts of Broad Ligament.*—These are rare compared with ovarian cysts, occur more frequently in young persons, are of very slow growth, often continue for a long time without deranging the general health, and seldom prove fatal.

As they are often cured by a single tapping, and so do not need extirpation, it is important if possible to make out the diagnosis.

They may be thus contrasted with unilocular ovarian cysts.

Parovarian Cysts.

Rare; always monocystic.
Mostly in young persons.
General health unimpaired for a long time.

Seldom attain any considerable size.
Abdominal veins less prominent.
Walls usually very thin.
Fluctuation very distinct and superficial.

Per Vaginam.—Fluctuation very distinct; uterus normal in size and position, or somewhat lower in pelvis.

Scarcely ever refill after tapping.

Very seldom fatal.

Fluid limpid like clear water, of low specific gravity, generally under 1005; contains only a trace of albumen, which is only precipitated by nitric acid, not by heat alone.

Unilocular Ovarian Cysts.

Common.
Occur at all ages.
Gives way earlier.

May attain any size.
Veins more marked.
Walls often thicker.
Less distinct.

Fluctuation less evident; uterus generally behind tumor, often dragged up somewhat, or tilted to one side.

Refill often rapidly.

Almost always fatal in time.

Fluid clear, viscid, highly albuminous; specific gravity 1007 to 1015, or more; a glittering pellicle of cholesterin often forms on the surface.

Hydatids, growing from some part of the peritoneal surface or from the liver, often acquire an enormous bulk, distending the abdomen proportionally, and simulating in many respects large ovarian tumors.

The history usually shows that the enlargement commenced in the upper part of the abdomen, and gradually extended downwards towards the pelvis, and that the growth has been very rapid.

Fluctuation is mostly obscure and circumscribed, but when the hydatid fremitus can be felt it is decisive.

The surface of these tumors is often irregular, the interspaces or depressions between the projecting masses very distinct. A vaginal examination generally proves the pelvis and hypogastric region to be free from the presence of a cyst.

Where the diagnosis is still doubtful, puncture of the cyst with the aspirator and trocar, and examination of the fluid, will effectually clear up the question.

The fluid is perfectly colorless, transparent, and watery as a rule, occasionally slightly opalescent, of low specific gravity—1007 to 1009—generally alkaline or neutral in reaction, but occasionally acid, consisting mainly of a strong solution of chloride of sodium, without any albumen or other organic substance, but said to contain succinate of soda (Roberts). Numerous hooklets are often detected under the microscope.

Renal Cysts.—Hydro- and pyro-nephrosis, and hydatid cysts, are often mistaken for ovarian cysts. Solid renal tumors, whether innocent or malignant, may simulate pseudo-colloid, cysto-sarcomatous, or malignant tumors of the ovaries. Renal tumors may generally be recognized by the following characteristics:

They push the intestines forward, ovarian backwards.

Renal tumors begin in the lumbar region, and grow forwards and downwards.

Ovarian tumors generally begin in one inguinal or iliac region, and extend upwards and inwards.

Renal tumors lie behind the intestines, ovarian in front, except in those cases where the intestine has become adherent to the anterior surface of the ovarian cyst.

The descending colon usually crosses the left kidney obliquely from above downwards, the ascending colon usually runs along the inner border of the right kidney, when these organs are enlarged. If any doubts exist whether it be intestine in front of the tumor, on rolling it under the fingers the intestine contracts into a firm, cord-like band; or insufflation *per rectum* may be effected, when the gurgling of flatus may be heard on auscultation, or the altered resonance prove that it is really intestine.

An elastic tube might also be passed *per anum*, with a view to clearing up the question when the left kidney is involved.

Although the urine may be perfectly normal, the healthy kidney alone secreting urine, in many cases there will be found evidence of pus, blood, albumen, or epithelium in the urine, and frequently a history of urinary troubles, such as hæmaturia, calculus, albuminuria, nephritic colic, or some notable change in the quantity or state of the urine.

In ovarian tumors there is more likely to have been menstrual derangements, and some alteration in the mobility or situation of the uterus is generally detected.

Renal tumors are comparatively rare, and grow slowly.

Should the nature of the case, after careful examination, be still doubtful, it will be well to aspirate, and draw off a small quantity of fluid for examination.

If renal, the fluid will often possess a faint urinous odor, urea, urates, and chlorides in the normal proportion being detected. Simon's method of exploration by the hand in the rectum is often of great value in determining the pelvic origin or not of tumors.

A floating or movable kidney may become enlarged, and then be mistaken for an ovarian tumor. The kidney usually preserves its normal characteristic shape, though the hilus may be turned upwards. The kidney cannot be detected in the region it normally occupies, but the tumor can be pushed back into this position, and may also be moved about freely in the abdomen. It is rarely connected in any way with the pelvis. An exploration of this cavity will generally enable us to decide that the tumor is not ovarian.

Large Renal Cysts.

Very rare, and grow slowly.

History generally of urinary troubles. Evidence at some time of pus, blood, or albumen in urine; of nephritic colic from an impacted calculus, etc.

No catamenial derangement.

No characteristic expression of features.

Ovarian Cysts.

Common, and grow more rapidly.

None. May be history of dysmenorrhœa, or other menstrual derangement.

Catamenia often scanty.

Facies ovariana.

Large Renal Cysts.

Emaciation appears late.

Early œdema of lower extremities.

Tumor commences in lumbar region, and grows forwards and downwards.

Unilateral and fixed from first.

Not quite symmetrical at any time.

Lies behind the intestines, which are pushed towards mesial line.

Per Vaginam.—Tumor, even if it extends to pelvic brim, perfectly independent of pelvic organs; often not detectable.

Rectal exploration confirms this.

Fluid contains urea, urates, and chlorides; not necessarily albuminous.

Urine usually contains pus, blood, or albumen.

Ovarian Cysts.

Early.

Edema appears late, if at all.

Commences below, and extends upwards and towards mesial line.

Unilateral and movable at first.

Symmetrical when cyst large.

Lies in front of intestines, which are pushed upwards and outwards.

Tumor almost invariably detected, and felt to be connected with pelvic organs.

Rectal exploration shows tumor to be attached to one or other side of the uterus.

Fluid highly albuminous; no urea. Often contains cylindrical epithelium, cholesterin, leucocytes. Granular cell.

Urine normal, though diminished in quantity.

Pregnancy is often mistaken for ovarian tumor.

Little reliance as a rule should be placed upon subjective statements, for in cases where these are of most value they are often least reliable. "Where pregnancy is real or suspected, the patient may mislead the surgeon intentionally, or from her own hopes or fears biasing her judgment. An unmarried girl, or a married woman whose husband is absent, or a widow, may have very strong reasons for concealing pregnancy, and hoping or asserting that she has an ovarian tumor. Or a sterile wife, or one advancing in age, suffering from a tumor, may have grounds almost equally strong for hoping that she may be pregnant" (Wells).

Objective signs then should mainly be trusted to.

In pregnancy the mammary signs are usually very characteristic at the time when an ovarian tumor is at all likely to be confounded with this condition, say from the fifth to the seventh month. The breasts are full, the areolæ darkened, the follicles enlarged, the nipple prominent and exudes a milky fluid on pressure.

On inspection of the abdomen, it is found to be enlarged symmetrically, prominent in front. In primiparæ the umbilical areola is often very distinct.

On palpation a central, firm resistant tumor, less dense than a fibroid, more solid than a cyst, pyriform in shape, may usually be detected. Rhythmical contractions may often be felt if the tumor be gently grasped by the outspread hand; the contour of the fœtus or distinct movements may often be perceived.

Per vaginam the abdominal tumor may be felt to be continuous with the neck of the uterus, which latter is enlarged, softened, infundibular in shape, the os admitting the finger readily, and being directed backwards. *Ballotement* detects the fœtal head or breech, which produces an impulse when pushed up and allowed to descend.

On percussion the areas of resonance and dulness are similar to

those noticed in ovarian tumors: dull in front, resonant in the flanks, but little altered on change of position.

On *auscultation* foetal heart-sounds are distinctly audible towards the end of the fifth month, averaging 140 in a minute. The placental bruit may also be heard, but is of less value diagnostically, as a similar bruit is occasionally produced in the case of uterine fibroids.

Cases of pregnancy with hydrops amnii are very liable to be confounded with large ovarian cysts, especially as the size of the uterus is out of all proportion to the stage of development, thus simulating a rapidly growing ovarian cyst. The uterine walls are much thinner than usual from the undue distention, so that fluctuation is very superficial, and may readily simulate that detected in thin-walled ovarian cysts.

The signs of pregnancy previously enumerated, especially *ballotement*, softening of the cervix—the tumor being continuous with this—the cervix spreading out or enlarging gradually into the tumor and moving simultaneously with this, should enable us to form a correct diagnosis.

The sounds of the foetal heart are often obscure and distant, but the foetal movements, if detected, or the head pressing down in the cervix, can hardly be mistaken for anything else.

Should, however, the diagnosis be very difficult, and the question of operation urgent, it will be better to pass the uterine sound, which would at once clear up the diagnosis. Even if labor were thereby induced, this would be better than puncturing the pregnant uterus with a trocar, or exposing it by an exploratory incision.

Normal Pregnancy about Sixth Month.

Enlargement has developed within six months at furthest; only noticed a few weeks at most.

Symmetrical.

Countenance natural, healthy.

Catamenia absent for some months.

Mammæ full, areolæ darkened, follicles enlarged, nipple prominent, exuding a milky fluid on pressure.

Umbilical areola in primiparæ.

Superficial abdominal veins not enlarged.

Tumor pyriform-shaped, resisting, and dense.

Rhythmical contractions.

Fluctuation very indistinct.

On vaginal examination uterus found to be enlarged, cervix softened, and apparently shortened. *Ballotement* detects body within uterus.

Foetal heart-sounds heard. Movements felt when child living.

Ovarian Tumor up to Umbilicus.

Has developed more slowly, as a rule, and been noticed for many months, if not a year, at least.

More to one side.

Anxious.

Generally regular, though may be scanty.

Mammæ only exceptionally enlarged; seldom other signs manifest.

Not present.

Veins often distinct.

Tumor less uniform in shape, often irregular.

None.

Fluctuation often distinct.

Uterus normal in size, usually behind cyst, often displaced. *Ballotement*, even if practicable, detects nothing.

None.

Molar Pregnancy.—Vesicular mole, or uterine hydatids, from cystic, or so-called hydatidiform, degeneration of the chorion, when

prolonged, may give rise to some confusion. There is often rapid increase of the uterine tumor, the size not corresponding with the supposed period of pregnancy. Usually more or less profuse watery and sanguineous discharges take place about the mid-period of pregnancy, often even earlier, which will at once put us on our guard as to the probable nature of the case.

There is more general disturbance of the health than is natural, the vomiting is often excessive, and the discomfort from the rapid and undue distention of the uterus often very distressing.

The discovery of portions of cysts with the discharge resembling currant juice is a certain diagnostic sign of this condition.

Retained Encysted Fœtus, in cases of extra-uterine gestation, may usually be recognized by the history of supposed pregnancy which never terminated in parturition. The outline of the fœtus may be detected possibly, or where a long interval has elapsed the tumor may present a firm and irregular outline, situated low down in the abdomen or even entering into the pelvis.

The condition of the tumor has been stationary for some time.

Ovarian Tumor complicating Pregnancy.—This condition not infrequently occurs, and may complicate the diagnosis considerably. The abdomen is more widened out than in either of the single conditions, and the limits of each tumor may generally be defined by the ordinary methods. There is commonly a marked sulcus or depression between the two tumors. There is often a history of the presence of a comparatively slow-growing tumor—ovarian—rapidly becoming more prominent, or apparently enlarged, from the complication of pregnancy supervening, the symptoms of this latter condition being marked by the usual amenorrhœa, sickness, etc.

There are other enlargements of the uterus unconnected with pregnancy which are often mistaken for ovarian tumors.

Of these *fibroid* and *fibro-cystic tumors* probably offer the greatest difficulty as regards diagnosis.

Fibroid Tumors of the uterus occasionally attain a very large size. There is usually a history of menorrhagia. They are generally of slow growth, confined to the lower part of the abdomen (unless very large), apparently fixed there, cannot be raised at all, or only with difficulty, by the hand pressed backwards between the tumor and the pubes.

On vaginal examination the vagina may be found to be more or less completely obliterated by a dense, solid mass, the cervix uteri effaced, the os uteri reached with difficulty, the cervical canal so compressed or contorted that the uterine sound will not pass, or where this is practicable the sound enters a tortuous canal many inches beyond the normal length. Every movement of the abdominal tumor is communicated immediately to the uterus, which is felt to move in all directions with the pelvic portion of the tumor. If, in addition to these signs, we detect small, marble-like tumors, sessile or pedunculated on the main mass, we need have little doubt that the case is one of fibroid tumor.

Large, uniformly solid ovarian tumors are exceedingly rare.

Uterine Fibroid.

General health fair. No emaciation.
 Countenance natural or anæmic.
 Not uncommon.

History of menorrhagia.

Slow growth, often extending over years.

Surface lobulated and firm.

Abdominal veins not enlarged.

Tender on pressure, more marked during menstruation.

Sense of elasticity occasionally, but no true fluctuation.

Tumor confined to lower abdomen, apparently fixed there; cannot be raised from pelvis.

Per Vaginam.—Tumor inseparable from uterus, with which it moves; dense and firm. Cervix often obliterated. Uterine cavity elongated; canal often tortuous.

In cases of sub-peritoneal pediculated fibroids, tumor more mobile independently of uterus.

Ovarian Cyst.

Health impaired. Emaciation.

Anxious, pinched, seldom anæmic.

Large solid tumors very rare.

Catamenia often scanty.

More rapid growth, seldom over one year.

Smooth and yielding generally.

Enlarged.

Not so.

Fluctuation distinct.

Not so. Can be raised from pelvis.

Separable from uterus, not moving with it; tense, elastic, fluctuating. Uterus normal; cervix natural length; canal not tortuous.

Fibro-cystic Tumors of the Uterus, when they have attained a considerable size, are with great difficulty distinguished from multilocular or semi-solid ovarian tumors. Of nineteen cases collected by Dr. C. C. Lee, eighteen were operated on under a mistaken diagnosis of ovarian cyst.

Both uterine and ovarian tumors may lead to very great enlargement of the abdomen; be central in position or incline to one or other side; be either round, ovoid, or irregular in form; smooth or lobulated on their surface; either hard or elastic or fluctuating; either tender or insensible to pressure; and either adhering to the abdominal wall or moving beneath it with or without crepitation (Wells).

Kœberlé thinks the diagnosis of a fibro-cystic tumor may be established by the following signs:

1. The discolored line and dejected expression of the face, the so-called *facies uterina* of the patient.

2. The variable consistency of the tumor as made out by abdominal palpation.

3. The results of tapping. If the trocar touch a fibrous spot in the tumor wall, blood will flow. Even when the cyst is reached, the fluid never presents the clear viscid character of ovarian cystic fluid, but is either yellowish, thin, serous, and rich in lymph or cholesterin, or it is brown, muddy, sero-purulent, or bloody, and the tapping leaves only partial collapse.

4. The indurated or nodular feel of the tumor after tapping.

5. The uterine connections of the growth, as made out by vaginal, and uterine examination by aid of the sound. The uterus is more displaced than in ovarian tumor.

The history may guide us somewhat. Fibro-cystic tumors rarely occur before thirty; the rate of development is slow, often extend-

ing over several years. The solid portion of the tumor preponderates over the cystic. The tumor involves the body and neck of the uterus, cannot be raised from the pelvis; the abdominal tumor moves synchronously with the pelvic portion. On exploratory incision the tumor is dark, vascular, thick, and frequently fasciculated with fibrous bands, differing essentially from the pearly white or blue and glistening surface of an ovarian tumor.

Fibro-Cystic Tumor of Uterus.

Seldom occurs before the age of thirty years.

Comparatively rare.

Generally of slow growth at first.

General health not affected for a long time.

No emaciation.

Complexion often florid, discolored.

Expression dejected. *Facies uterina*.

Abdominal veins not enlarged.

Umbilicus not prominent.

Menorrhagia more often than amenorrhœa.

Urine normal in quantity.

Tender on pressure.

Elasticity; subsequently fluctuation.

Variable consistence; lobulated surface.

Solid portion preponderates over cystic.

Tumor dark, vascular, fasciculated, with fibrous bands.

Per Vaginem.—Tumor firm at first, continuous with uterus, involving the body and neck of uterus, with which it moves, if at all, but cannot be raised from pelvis.

Uterine cavity elongated.

Fluid, on tapping, yellow, thin, serous, not viscid; little albumen; rich in lymph or cholesterolin; or brown, muddy, sero-purulent, or bloody; spontaneously coagulable.

Ovarian Tumor.

Often earlier as well as later.

More common.

Growth more rapid.

Often fails early in case of compound cysts.

Emaciation.

More often pale.

Anxious, but more hopeful. *Facies ovariana*.

Enlarged.

Prominent.

The reverse.

Often scanty secretion.

Not so.

Fluctuation from first.

More uniform in consistence and surface.

Cystic portion predominates.

Pearly white, or blue and glistening surface.

Cystic from first, not continuous with uterus; uterus normal in size; tumor can be raised from pelvis independently of uterus.

Not so.

Fluid clear, viscid, highly albuminous, though it may be turbid, chocolate color; not spontaneously coagulable; sometimes colloid.

Hæmatometra, or distention of the uterus from retention of the menstrual fluid, may in rare cases simulate ovarian tumor. The history of amenorrhœa, severe pain at the menstrual epochs, and the discovery of occlusion of the vagina or cervix uteri, should serve to distinguish this condition. It may be congenital, the patient never having menstruated, or acquired from accidents during labor.

The increase in size is very gradual. There is tenderness in the tumor at the monthly periods.

Physo-hæmatometra occurs when the accumulated fluid undergoes decomposition, and gas becomes mixed with blood.

Hydrometra, or distention of the uterus from the accumulation of mucous or muco-purulent secretion, occurs in rare instances as a

senile form of occlusion, but seldom attains any considerable size. It often ends spontaneously by the discharge of a grayish and sometimes very fœtid fluid.

Physometra, or accumulation of air in the uterus, is a very rare condition, occurring in hysterical women. There would be more or less resonance on percussion. Air is not infrequently discharged *per vaginam*.

Distention of the Bladder from retention of urine has before now led to the supposition of the presence of an ovarian tumor, and has led to the viscus being tapped. The dribbling away of urine, being simply the overflow from the paralyzed bladder, has been regarded as due to incontinence of urine from pressure of the imaginary cyst.

The central position in the lower abdomen, rapid formation, with intense discomfort, should at once suggest the passage of the catheter. A small elastic one should be employed. The rapid disappearance of the tumor on the withdrawal of the urine will at once settle the question.

Encysted Dropsy of the peritoneum from the occurrence of peritonitis may occasionally give rise to some difficulty in diagnosis. The intestines are bound down by adhesions, the fluid being contained in front, often extending over the whole of the abdomen. Separations may sometimes be felt in the form of depressions. There is usually the history of acute inflammatory symptoms, and more or less sudden appearance of the effusion. The abdomen is flat, not prominent. Respiration is not impeded. Fluctuation is feeble and limited, and does not alter in situation on changing the position of the patient. If felt, it gradually diminishes and ultimately disappears. No enlargement of the abdominal veins or œdema of the legs ensues. If the fluid be aspirated flakes of lymph will often be found, a coagulum of fibrin will spontaneously be deposited, and the fluid will coagulate on heating it.

Encysted Dropsy of Peritoneum.

Extremely rare; preceded by attack of peritonitis; increases slowly.
Respiration not impeded.
Digestion unimpaired.
Abdomen not prominent; often depressed in places, or fat.
Abdominal veins not enlarged.
No œdema of legs as a rule.
Fluctuation feeble and limited; fluid in front of intestine.

Per Vaginam.—No tumor felt; seldom fluctuation detected.

Uterus normal in position, occasionally fixed by adhesions.

On tapping, amount of fluid small.
Flakes of lymph often found. Coagulum of fibrin spontaneously deposited.

Coagulates on heating.

Ovarian Cyst.

Common; preceded by good health; increases more rapidly.
Dyspnœa as cyst attains large size.
Generally affected.
Everywhere prominent.

Enlarged.
Often œdematous.
Marked, extending over area of dullness; intestines pushed to sides of abdomen.

Tumor well defined; fluctuation occasionally marked.

Uterus generally posterior to tumor; occasionally drawn up or tilted.

Very large quantity often obtained.
No flakes of fibrin unless previous inflammation of cyst.

Also coagulates.

Encysted Abscess of the peritoneum, from septic peritonitis, cancer, or tuberculosis, may simulate ovarian dropsy.

The rapidity of its formation and the history of previous inflammatory mischief may assist us in forming an opinion as to the character of the accumulation.

The vaginal examination disclosing adhesions between the pelvic organs, or the presence of a dense deposit at the roof of the vagina, may also help to clear up the diagnosis.

Fibro-fatty Tumors of the Abdomen may cause enormous distention, rendering the walls exceedingly tense, presenting a distinct sense of fluctuation, the vibratile wave being most perfect, so that it is impossible to distinguish them from ovarian tumors.

Cancerous Disease of the Omentum may form a tumor of considerable size, and where, as not infrequently happens, this is complicated with ascites, the difficulty of determining the nature of the growth is often extreme.

They are generally of irregular shape, often of rapid growth, more or less painful. The general health is affected, emaciation sets in early, and the characteristic cachexia ensues.

Fæcal Tumors occasionally occur, but seldom sufficiently large to be mistaken for ovarian tumors.

They possess a peculiar doughy feel on manipulation, and on steady pressure a distinct indentation may be made in them, which remains after the pressure is removed.

There is usually a history of constipation, alternating with colic and attacks of diarrhœa.

They may occur in any part of the large intestine, not necessarily only in the lower portion.

Enlargement of the Liver takes place from above downwards. There is an area of resonance below the tumor, that is between the lower margin and the pelvis; the tumor is independent of the pelvis. The sharp edge of the liver can often be plainly felt, and the fingers can be inserted underneath.

The position on the right side is also typical.

The symptoms of hepatic disorder are often well-marked.

Enlargement of the Spleen from leukæmia may be suspected from the appearance of the patient. The tumor is situated on the left side, grows downwards and towards the middle line, is dense, with a well-defined, sharp, hard border. The notch may often be recognized.

The tumor is not connected with the pelvis.

Diagnosis in the early stage of an Ovarian Tumor.

Although practically it but seldom happens that we are called upon to diagnose an ovarian tumor before it has become sufficiently large to be felt in the abdomen, it will be well briefly to consider how we can recognize a small intra-pelvic ovarian tumor, and with what other conditions it is liable to be confounded.

An *ovarian cyst*, the size of a large orange or small cocoanut, may

occupy the pelvis, pushing the uterus out of position, and causing serious discomfort from pressure. It will usually be found lying in the retro-uterine pouch, displacing the uterus forwards, or it may be upwards and to one side.

The cyst is generally tense, smooth, rounded. On conjoined manipulation, fluctuation may be distinct. On passing the uterine sound, the uterus may be felt to move independently of the cystic tumor.

The conditions *most liable* to simulate a small ovarian cyst are: *Retro-version or -flexion of the gravid uterus* from the third to the fourth month.

Tubal, or other form of Extra-uterine Gestation.

Pelvic Abscess. Dropsy of the Fallopian Tube.

Where *retro-version or -flexion of the gravid uterus* about the third or fourth month occurs, there is usually the history of pregnancy, with possibly the occurrence of a fall, to account for the misplacement.

The cervix uteri is generally high up behind the pubes, and difficult to reach with the examining finger; it is enlarged and soft. The fundus uteri presents the character of a softish solid mass, not fluctuating, more fleshy and resisting than in the case of an ovarian cyst, enlarging uniformly to either side of the cervix.

The mammary signs of pregnancy,—fulness, increase of area and darkening of areola, enlargement of follicles, etc.—are generally well marked.

In *tubal or extra-uterine gestation*, within the fourth month, the patient generally believes she is pregnant. The uterus is enlarged, the cervix softened. The uterus is pushed out of its normal position by a tumor, generally behind or to one side of the uterus. The tumor is elastic in character, often presenting an obscure sense of fluctuation. *Ballottement* may often be detected. The history of amenorrhœa for two or three months, with irregular crampy or paroxysmal colicky pains, occasional attacks of menorrhagia, with possibly the expulsion of the decidua in one mass, will also assist us in forming an opinion.

The mammary signs of pregnancy are generally distinct, often typically developed.

Pelvic Abscess.—The history here will be important. The fact of a rigor followed by febrile symptoms and other local indications, such as throbbing pain, irritability of bladder and rectum, with a sense of pressure and discomfort, will be sufficient to show that pelvic cellulitis has taken place.

The detection, *per vaginam*, of a painful, tense, fluctuating tumor, pushing the uterus out of position, and fixing it more or less, will generally serve to distinguish the nature of the affection. It must, however, be remembered that an ovarian cyst may set up pelvic peritonitis, which fixes the tumor in the pelvis, though this is comparatively rare.

Puncture with the aspirator trocar, and examination of the fluid, will settle all doubts.

Dropsy of the Fallopian Tube.—This is usually of limited size. The cyst, in place of being uniform or rounded, is often subdivided by tight fibrinous bands encircling and constricting the tube at various points, so that it presents the character more of a tortuous convoluted saccular dilatation than that of a simple cyst. Other conditions may cause some little difficulty to the inexperienced, and may therefore be mentioned; but to class them with those most likely to mislead the practitioner would create more confusion than necessary. Such are:

Distention of the Rectum by Fæces; Cancer of the Rectum; small Fibroid Tumors of the Uterus; Hæmatocele; Pelvic Cellulitis.

Accumulation of Fæces may be recognized by the peculiar doughy feel of the mass—the finger when pressed upon it through the vagina indenting it permanently.

Examination *per rectum* at once detects the fæcal accumulation. The effects of castor oil, and the administration of an enema, will generally be sufficient to remove the mass.

Cancer of the Rectum.—The general symptoms of irritation of the lower bowel, diarrhœa, offensive slimy discharge, like coffee-grounds mixed with pus, are usually present. When of an encephaloid character, there is often a large softish tumor to be felt, blocking up the rectum. There is frequently very little pain or discomfort if the growth be not near the anus.

A small sub-peritoneal *Fibroid* of the uterus may be diagnosed by its hardness and its connection with the uterus.

Retro-uterine Hæmatocele.—The history of the sudden invasion of symptoms in connection with some uterine disorder or menstrual irregularity, the fixity of the uterus, and the character of the effusion, will generally enable us to distinguish this affection.

Pelvic cellulitis rarely presents any serious difficulty. The history of inflammatory mischief following parturition or operation on the uterus, the absolute immobility of the swelling, and its more diffused character than in the case of ovarian tumor, will be sufficient to distinguish the two affections.

Diagnosis of Adhesions of Ovarian Cysts.

Although moderate adhesions offer no serious difficulty to the removal of ovarian tumors, nor the fact of their presence diminishes the prospect of recovery, yet where extensive and intimate adhesions to the pelvic cavity, or to the lower surface of the liver or intestines, exist, ovariectomy may be altogether frustrated, or its completion inflict so great an amount of injury as to produce a fatal result.

The tumor may be presumed to be free from adhesions if

1. There have been no attacks of peritonitis, as evidenced by pain, etc.

2. If on grasping the tumor with both hands through the abdominal wall it can be moved from side to side, or the abdominal wall can be freely moved over the tumor, or lifted up from its surface.

3. If on inspiration the tumor can be seen to glide downwards, and upwards again on expiration.

4. If the tumor can be seen to fall to the dependent side on altering the position of the patient.

5. If a layer of ascitic fluid co-exists with the tumor.

6. If the abdominal walls be very thick.

7. If the uterus be normal as to position and mobility.

8. If the cyst collapses and falls towards the pelvis after tapping.

Adhesions may exist posteriorly although the tumor appears mobile. It is more in respect to adhesions anteriorly and laterally that the previous remarks apply. There may be extensive adhesions, and yet these have become so drawn out that the tumor may admit of free movement, although its removal may be attended with difficulty. Pelvic adhesions may be simulated by a portion of the tumor being more or less impacted in the pelvis.

Where the uterus and tumor seem to be intimately associated and the sound *in utero* fails to produce separate movement, or the uterus is found to be fixed in the pelvis, adhesions are probably present. Malignant forms of tumor are more commonly adherent than benign. Where adhesions are recent, a fremitus or friction-movement may often be felt by the hand as the tumor moves up and down on respiration, but this is also simulated by prominent vessels or other inequalities on the surface of the tumor, and often shows that no adhesions exist. Where the tumor is low in the pelvis, and especially if the uterus be elevated or drawn out of its natural position, adhesions are likely to exist. Adhesions are more likely to occur where pregnancy complicates the course of the tumor.

The fact of previous tapping having been resorted to, unless the cyst be already adherent at the seat of puncture, does not determine adhesions.

Diagnosis of Malignancy.—This is often important, for if malignant the case is not suitable for ovariectomy, whereas if a benign tumor be diagnosed as malignant, and an operation be refused, we deprive the patient of her only chance of recovery.

Carcinoma is the least common of all the diseases of the ovary. The general health fails early; emaciation is often out of all proportion to the size and duration of the tumor; the well-known cachexia supervenes. Where a rapidly growing solid tumor, nodular or irregular in outline, accompanied by a rapid accumulation of ascitic fluid, occurs in an elderly person, the presumption is strongly in favor of malignancy. Evidence of cancer in other organs would also guide us in our opinion. Lancinating pain, especially at night, is always suspicious.

If the uterus be found adherent to the tumor, if nodular masses exist posterior to or around the cervix, as detected by rectal exploration, together with the other symptoms just mentioned, the evidence is very strong.

Malignant degeneration of the cyst wall, as a secondary deposit, occasionally occurs, in the form of proliferating papilloma. If the

fluid be examined, we shall detect grape-like clusters of cells, of very varying shape, many of which have multiple nuclei. In this case speedy removal of the tumor offers the only hope for the patient. If, however, a similar condition of the ascitic fluid be detected, it indicates that the peritoneum is involved, and that an operation is too late.

Where the measures already described fail in enabling us to establish a correct diagnosis, there are still others at our disposal. These are *aspiration*, *tapping*, and *exploratory incision*.

Aspiration of a small amount of fluid for chemical and microscopical examination may be performed by means of an ordinary hypodermic syringe. Two or more punctures may be made in different situations, in order to determine whether the case is one of polycystic tumor, though if this latter be suspected, it will be better to employ a Dieulafoy's aspirator, as the fluid is often very viscid, or may be colloid in character, and in that case the hypodermic syringe would probably be inefficient.

Tapping, for diagnostic purposes only, should not be rashly undertaken, as it is not free from danger. In simple ovarian cysts, where the fluid is generally of a bland, unirritating nature, tapping is not, as a rule, a dangerous operation. But in polycystic tumors it is a very dangerous operation, for the cyst wall being very vascular, hæmorrhage may ensue from wounding a vessel; or inflammation of the cyst may supervene with consequent suppuration; or peritonitis may result from the escape of irritating fluid from the cyst into the peritoneal cavity.

In cases of ascites with suspected ovarian tumor, tapping may be resorted to in order to determine the presence or otherwise of a tumor, and if possible to settle the question of malignancy.

If a very thin-walled unilocular cyst be detected, tapping may decide whether it be merely a cyst of the broad ligament, or a true cystoma of the ovary. In the former case the cyst does not often refill, and thus we have gained a double advantage, having made a permanent cure. In the latter, tapping may determine the existence or non-existence of extensive adhesions.

Tapping may also be of great service in determining the differential diagnosis of ovarian cysts and fibro-cystic disease of the uterus.

Where it is doubtful whether we have an ovarian polycyst, a renal, or an hepatic cyst, tapping may be justifiable, provided that if the character of the fluid shows the tumor to be ovarian, the operation of ovariectomy shall forthwith be proceeded with.

Exploratory incision should not, as a rule, be resorted to for diagnostic purposes until surgical interference of some kind is demanded, and not then, unless ovariectomy be proceeded with, if the case prove a favorable one for operation.

As it involves opening the peritoneal cavity as well as manipulation of its contents, the operation is by no means free from danger, many cases terminating fatally within a few hours or days.

Prognosis.—A consideration of the natural course and termina-

tion of ovarian cysts shows that in at least ninety per cent. patients die within two years after first seeking medical aid, unless an operation be resorted to.

The methods in which death is produced have been already indicated. Trivial intercurrent affections, of no importance to a woman in health, may rapidly prove fatal to a patient whose every function is deranged, and whose general standard of health is so deteriorated.

Treatment (Medical).—As regards effecting a radical cure of an ovarian tumor by any known internal remedy or external application, there is not trustworthy evidence that anything has the slightest influence either in arresting the growth or producing absorption of the contents. Instances of supposed cure have more than probably been cases of mistaken diagnosis.

Wells remarks: "It is better at once to put aside the old presumptuous talk about deobstruents, discutients, evacuants, and such like delusively promissory inanities."

Bromides, iodides, chlorates, mercurials, and pretty well every drug in the pharmacopœia, have been tried in vain.

In fact, so utterly useless is medical treatment as a means of cure, that any further consideration of the subject is unnecessary, and would be eminently unprofitable.

Any measures calculated to improve or preserve the general health may prove of service in delaying a fatal termination. Sedatives or stimulants, tonics and aperients, attention to diet, exercise, and other similar indications, may be of service in palliating symptoms, but beyond this the physician can accomplish nothing. The surgeon, however, has rescued ovarian tumors from the domain of hopeless incurability, and we shall now consider the various expedients that have been adopted for the removal of these growths.

CHAPTER XXI.

SURGICAL TREATMENT OF OVARIAN CYSTS, INCLUDING OVARIOTOMY.

Surgical Treatment of Ovarian Cysts.—To prevent the repetition of operations which experience has condemned as unsatisfactory and unreliable, it may be well to mention the various proceedings which have from time to time been tried for the relief or cure of ovarian cystic tumors.

Tapping, as a preliminary or palliative measure, and ovariectomy as a curative method, are, however, the only ones to be relied upon.

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| I. Palliative Treatment. | Simple Tapping. | { 1. Through the abdominal walls.
{ 2. Through the vagina.
{ 3. Through the rectum. |
| II. Curative Treatment. | { A. Tapping followed by pressure.
{ B. Tapping followed by injection of iodine. | { Externally.
{ Per vaginam.
{ Per rectum.
{ Internally, by partial incision of sac. |
| | C. Formation of permanent opening in cyst. | |
| | D. Ovariectomy, or entire extirpation of the ovarian cyst. | |
| | | |

I. PALLIATIVE TREATMENT. *Simple Tapping; Paracentesis.*—We have already considered the advantages of tapping as an aid to diagnosis. The operation may be expedient in certain slow-growing, unilocular, thin-walled cysts, occurring in young persons, on the chance of their being parovarian, when as a rule they do not refill, and thus a permanent cure is established.

In other cases, where the diagnosis is doubtful, or where ovariectomy has been decided to be impracticable, tapping may prove of much value in facilitating diagnosis, or in prolonging life by rendering the patient's condition more endurable.

Tapping is also of service, as a preliminary measure, in those cases where from the enormous distention of the abdomen the tumor has produced such an amount of pressure as to interfere materially with the functions of the kidneys, heart, and lungs. Removal of this pressure will give the several organs time to recover themselves, and thus not only diminish the shock of the more important operation of ovariectomy, but also improve the prospects of recovery.

As a rule, if the tumor has been diagnosed to be polycystic, tapping should be avoided for the reasons previously indicated.

Apart from the dangers attending the operation, the cyst rapidly refills and the progress of the disease is often accelerated.

Where an ovarian cyst complicates pregnancy, or parturition, tapping may be necessitated irrespective of the nature of the cyst.

Where the general health has become much enfeebled before the case of a large ovarian cyst has been brought under observation, tapping may enable us to relieve the patient for the time being, and thus postpone the operation of ovariectomy until a more convenient time.

1. *Paracentesis abdominis; Tapping through the abdominal walls.*—Either instruct the patient to evacuate the contents of the bladder, or pass a gum-elastic catheter immediately before the operation. Ascertain whether pregnancy be suspected. Percuss the abdomen carefully at the time, to detect any intestine in front of the tumor; note also the presence of any enlarged superficial veins, and avoid them. See that a hip-bath, foot-pan, pails, or other large vessels are handy. Let the patient lie on her side, near the edge of the bed, so that the abdomen projects over the edge. If she happen to be exceedingly nervous, a few whiffs of chloroform may be given, or the seat of puncture may be frozen by ether spray. The linea alba is the preferable site for puncture, but if the tumor contain solid matter, this must be avoided, and the most elastic or distinctly fluctuating part of the tumor selected.

A small incision with a scalpel or lancet is then made through the skin, about midway between the symphysis pubis and umbilicus, in the linea alba, unless otherwise contra-indicated; the trocar is then plunged into the cyst. Thompson's trocar, with a yard of india-rubber tubing attached to the canula, answers the purpose best, as there is less risk of air gaining access to the cyst, especially if the end of the tubing be placed under water. The trocar is now withdrawn from the canula, exercising a suction power which draws a little of the fluid into the canula, and so a siphon action is produced, the fluid continuing to run until the cyst be emptied. Care must be taken to keep the end of the tube under the fluid when the cyst is nearly empty, lest air be sucked into the cyst from the movements of respiration.

Before incising, a long binder may be placed round the abdomen, a slit being made in it opposite the intended seat of puncture, or an assistant may compress the abdomen with the extended hands as the fluid is evacuated, so as to prevent the occurrence of faintness from sudden withdrawal of the abdominal pressure, as also the admission of air into the sac. The binder is gradually tightened, or compression by the hands increased as the fluid flows.

Should the cyst only partially collapse, the trocar can be again replaced in the canula to clear any obstruction, or another cyst be punctured, without withdrawing the trocar from the original opening. If solid matter be detected, it will be well to avoid interfering with it, lest hæmorrhage result. When the fluid has ceased running, press the abdominal walls well down upon the cyst, gradually withdraw the canula, and with the finger and thumb compress the

abdominal wall behind the escaping canula, so as to prevent the entrance of air.

A small dossil of cotton-wool steeped in collodion, or a small pad of lint and a few strips of adhesive plaster, should then be placed over the opening. If any bleeding occur, and this cannot be stopped by pressure, a hare-lip pin passed across the opening under the bleeding vessel, and a few turns of silk twisted round the pin, will generally suffice to arrest any further bleeding.

Where the amount of fluid withdrawn be great, it is better to apply some pads of cotton-wool, or other material, to the sides of the abdomen, and then a binder, so as to compress the abdomen and afford support. The patient must be kept perfectly quiet in bed for a few days, to avoid all risks of inflammation or other complications. When the fluid withdrawn is viscid, many recommend washing out the sac with warm carbolized water.

The dangers attending the operation of tapping by the abdomen are the risk of hæmorrhage from wounding a vessel either in the abdominal wall or in that of the sac. The former may generally be obviated by avoiding any superficial vessel, or even securing it after incision before the cyst be punctured. The latter is scarcely avoidable; peritonitis may ensue as a consequence, or effusion of blood into the cyst take place to a serious amount. If there be evidence of this, ovariectomy should at once be performed. Collapse may follow the rapid emptying of the cyst. Peritonitis may be set up by some of the fluid escaping into the peritoneal cavity, and prove fatal. Air may be sucked into the sac. Exhaustion may arise from repeated tapping. These dangers will be best avoided by attention to details already mentioned, and by performing the operation antiseptically.

2. *Tapping through the vagina* is more difficult than by the abdomen, and is also more dangerous. It is only applicable in a limited number of cases, as of a small cyst, which descends into the pelvis and bulges the posterior vaginal *cul-de-sac*, where fluctuation is well marked, and there is no solid portion detectable. There is more danger of injuring the vessels of the tumor, which are larger and more numerous at its lower part, as well as of wounding other organs. In polycystic tumors the larger cysts are generally uppermost, and solid masses in the lower portion. As a rule air enters the cyst, the opening fills up, and the fluid remaining in the cyst, or that freshly secreted, putrefies. Suppurative inflammation of the lining membrane of the cyst comes on, and is accompanied by a low form of exhaustive fever or pyæmia, which can only be relieved by making and maintaining a free outlet for the discharge.

Tapping through the vagina should therefore be practised only exceptionally, where the cyst is bound down in the pelvis by adhesions, and it is necessary to relieve the distress caused by pressure on the bladder and rectum. The employment of the aspirator trocar lessens the risks. Before operating, the bladder and rectum should be emptied, and the exact position of the uterus ascertained by touch and by the sound.

The patient may either be placed in the lithotomy position, or in the usual obstetric position on the left side. A moderately tight binder having been employed, or an assistant pressing the tumor firmly down into the pelvis, the forefinger or the middle and index fingers of the left hand are then passed *per vaginam* to the lowest and most accessible part of the tumor, an inch or so behind the cervix uteri. The point of the trocar having been withdrawn within the canula, this is then glided along the fingers by the right hand until the point is in contact with the intended site of puncture; the trocar is then projected and thrust in perpendicularly to the surface, and carried in the direction of the axis of the pelvis until the sense of resistance is suddenly lost. The trocar is then withdrawn, the canula remaining *in situ*, and the fluid allowed to drain off, or exhausted from time to time if the aspirator be employed. The trocar and canula are then withdrawn, and the patient kept perfectly quiet in bed. Nothing further should be done at present, beyond, possibly, injecting the cyst with some disinfecting liquid if the fluid be very viscid. Firm pressure over the abdomen must be employed for several days. Repeated tapping may result in gradual shrivelling up and obliteration of the cyst. This may often be attained with greater certainty by means of a drainage-tube being inserted, incision of a small portion of the cyst wall, or by injections of iodine. Severe reaction often follows these expedients; a discharge of ichorous fluid, gradually changing to purulent, takes place, which continues for several weeks, becoming less and less as the cyst becomes obliterated.

3. *Tapping through the rectum* is not an operation to be encouraged. Dysenteric tenesmus of a very distressing character not infrequently occurs, and fatal inflammation has followed the entrance of fecal gases into the cyst. Except in cases of atresia vaginæ, or where the vagina is so small as to preclude the requisite manipulation, puncture *per rectum* should not be resorted to.

If deemed expedient, the same precautions as those advised in puncture *per vaginam* should be attended to. A long curved trocar should be employed.

II. CURATIVE TREATMENT.—A. *Tapping followed by pressure* has been tried, but without success. It is a somewhat painful and quite unreliable procedure. After tapping, thick pads are applied to the abdomen, and pressure exerted by strips of plaster extending right round, so as to embrace the spine, meeting and crossing in front; a flannel bandage being applied over these, prevented from slipping upward by a strap round each thigh. This method should never be resorted to; it is liable to produce adhesions, and has nothing to recommend it.

B. *Tapping, followed by injection of iodine*, may be tried in cases of simple, movable, uncomplicated, unilocular cysts, where from any reason, such as the existence of phthisis, or where the patient will not submit to ovariectomy, no more reliable operation can be resorted to. It is at best a doubtful proceeding, and though spoken favorably of by a few enthusiasts, has not received the approval of

modern ovariologists. Wells says the only class of cases where its employment should be recommended, is where inflammation of the cyst has occurred subsequently to tapping, and the patient is suffering from absorption of the decomposing contents of the cyst and then only conjoined with drainage.

Tincture of iodine, pure, about four ounces, may be injected and allowed to remain in ten minutes, then withdrawn; or a solution of tincture of iodine and water, equal parts, injected. As a disinfectant, one part of the tincture to twenty of water may be employed.

c. *Formation of permanent opening in cyst.*—Wells considers this practice far more dangerous than ovariectomy, very much more uncertain in its results, and very much less likely to be followed by complete cure. It should therefore only be considered admissible in cases where ovariectomy cannot be completed.

It will be unnecessary to describe the various modes of operating. The vaginal one has apparently been most successful of any when undertaken as a primary operation. The cyst is punctured and either the canula or drainage-tube left in, the cyst being washed out repeatedly with disinfectant solutions. But when we consider that the treatment will need to be continued for months, and sometimes for years, that the patient is subject to an exhausting and offensive discharge, that peritonitis may at any time supervene which may prove fatal, it is needless to say the operation is not one that can be recommended.

Cases occasionally occur, where, on making an exploratory incision with a view to ovariectomy, the cyst is found to be so firmly adherent everywhere that its removal is impossible. Instead of closing up the wound completely, the tumor may be tapped, and the edges of the opening in the cyst fixed to the abdominal wall by suture, and the case treated as an abscess, by drainage, and the injection of disinfectant or deodorizing agents.

Ovariectomy.

This term, now so familiar to surgeons that any suggestion of changing it seems hopeless, is a barbarous compound of Latin and Greek which does not express the meaning intended. It implies cutting an ovary, or ovario-section, while the more appropriate and distinctive term, as suggested by Peaslee, to signify cutting out an ovary, or ovario-exsection, should be Oöphorectomy (*ὠοφορον* and *ἐκτέμνω*, to cut out the ovary).

Ovariectomy is the only reliable curative means at our disposal for the relief of patients who are the subject of ovarian tumors.

Indications for Ovariectomy.—Wells sums up the important practical conclusions that, so long as an ovarian tumor does not materially interfere with the appearance, prospects, or comfort of the patient; so long as no injurious pressure is exercised by it on the organs of the pelvis, abdomen, and chest; so long as heart and lungs, digestive organs, kidneys, bladder, and rectum perform their

functions without much disturbance; so long as there is no great emaciation, no very wearying pain, no distressing difficulty in locomotion; or, so long as such injurious influence can be counteracted by ordinary medical care, the patient should be left to that care, undisturbed by any surgical treatment.

Most modern operators agree in postponing ovariectomy until the tumor has attained such a size as to interfere somewhat with the general health, until the abdominal parietes have become attenuated, the patient slightly anæmic, and accustomed to an invalid life. The reasons being that a person in robust health does not bear a severe operation well; she incurs a greater risk of peritonitis, which destroys one-fourth of all who succumb to the operation, the healthy peritoneum being more liable to become inflamed than after protracted pressure, when it becomes less susceptible and more tolerant of interference. Anæmic patients are also less liable to hæmorrhage. If menstruation has been arrested by the ovarian disease, the uterus and ovaries being inactive, there is less danger of inflammation.

At the same time, the patient should not be allowed to go on so long unrelieved that the pressure of the tumor causes interference with the functions of circulation or respiration, or with the renal secretion, or the digestive function.

In unmarried patients, whose enlarged abdomen subjects them to much annoyance from uncharitable remarks, who regard their honor even of more value than life itself, we may be justified in performing ovariectomy sooner than we should otherwise do. It is a question whether the method of operating antiseptically may not shortly modify our views as to the time of operation. Comparatively small cysts are now frequently removed without any apparent increase of risk.

Where evidence of inflammation of the cyst, hæmorrhage into the sac, or peritonitis exists, we may be called upon to operate without delay. Cases have been reported of successful removal even during an acute attack of peritonitis. Should it be deemed advisable to wait until the acuteness of the attack has subsided, the operation should not be delayed too long, lest the adhesions become so firm as to interfere with the removal of the cyst.

If the tumor be suspected to be malignant, the sooner it is removed the better the prospect for the patient.

If on tapping, to confirm diagnosis, the tumor be found to be colloid in character, it should be removed without delay.

Contra-indications for ovariectomy. Extensive adhesions, especially of the lower portion of the tumor to the pelvic organs, if clearly diagnosed before the operation be attempted, may deter us from operating.

Ascites does not contra-indicate ovariectomy, provided it is caused by the ovarian tumor and is not due to any organic affection of some other organ. Extreme debility need not necessarily preclude ovariectomy as a forlorn hope, if it be due to the ovarian disease alone, and the patient desires the operation.

Peritonitis, as we have stated, instead of being a contra-indication, should be regarded as a reason for the prompt performance of ovariectomy.

Albuminuria, unless associated with other signs of Bright's disease, may be due to pressure on the kidneys, and need not prevent our operating.

Suspicion of malignancy should not forbid the effort to save the patient; if in doubt, operate.

Valvular disease of the heart is not necessarily a contra-indication.

A previous ovariectomy need not deter us from removing the other ovary should it become the seat of cystic degeneration.

Ovariectomy is absolutely contra-indicated by actually recognized cancer of the ovary, or of any other organ; by rapidly advancing tuberculosis, or scrofula; by all organic diseases of the brain, heart, liver, or kidneys; by ascites, if produced by disease of either of the three last-mentioned organs; by ulcers of the stomach or diseases of the alimentary canal which permanently impair general nutrition.

Scurvy, extreme anæmia or chlorosis, hectic fever, great weakness, red tongue, with rapid and feeble pulse; profuse diarrhœa, extreme emaciation and exhaustion, decided unwillingness to submit to the operation, or mental despondency and despair of recovery, would lead, if not to absolute prohibition, to a very unfavorable opinion as to the probable result.

Precautions before Operating.—Be extremely cautious in arriving at a diagnosis. Examine carefully the condition of the chest, in order not to overlook tuberculosis, heart-disease, pleuritic effusion, or other condition which might seriously interfere with prolonged anæsthesia. Test the urine for albumen, and examine it also under the microscope for casts, lest advanced Bright's disease prove to be the exciting cause of the ascites or œdema, and not merely pressure on the kidneys from the tumor.

Ascertain when the menstrual period is due, and do not operate for at least four days after, or ten days before, the expected period. If much ascites, anasarca, or œdema of the legs complicate the case, it may be well to tap the patient some few days before resorting to the more serious operation, so as to remove pressure and allow the several organs and functions to recover themselves a little. Having decided when the operation shall take place, avoid every possibility of the patient being exposed to any risk of infection from any of the exanthemata, and especially of erysipelas, pyæmia, or septicæmia, whether from the nurse or from any case of this description existing in the house where the proposed operation is to be performed.

Avoid all risk yourself of being inadvertently called to see any patient who may be the subject of any infectious disorder. Allow no friend to assist at the operation who has recently performed any post-mortem examination or who has attended any infectious disease.

Preparation of the Patient for Operation.—Before performing the

most formidable operation the surgeon encounters, every possible precaution should be taken to secure a favorable result. Should the patient be in a very anæmic condition when first seen it may be well, if the case be not urgent, to postpone the operation for a short time, until the condition of the general health has been improved by tonics, attention to diet, rest, etc. The skin should be induced to act by means of warm baths, frictions, and warm clothing. The digestive function should be attended to, any inactivity of the liver counteracted by a little blue pill, podophyllin, or other suitable remedy. The bowels should be regulated by an occasional dose of castor-oil, salines, or other aperients. Wells advises a draught of five grains of tartrate of iron, five of carbonate of lithia, and ten each of the bicarbonate of potash and soda, with a few drops of chloric ether two or three times a day. If the urine be scanty and high-colored, depositing lithates in abundance, nothing tends so rapidly to clear it as lithia, which leads to a more abundant secretion of urine, free from deposit. The bowels in any case should be freely opened by castor-oil the day before the operation, opium being given at bedtime to ensure sleep and allay any intestinal irritation. Thomas recommends opium every six or eight hours for a few days preceding the operation, to quiet the nervous system, allay any fears as to the operation, and lessen the tendency to peritonitis after the operation.

The diet for the last day or two should also be light and easily digestible, the least bulky and the most nutritious.

At the time of operation the patient should be clad in flannel drawers, worsted stockings, a flannel jacket with long sleeves, the night-dress being rolled well up round the waist, to prevent its becoming soiled and to avoid the necessity of having to change the linen after the operation. She should have no solid food within an hour or two of the operation. An enema may be given early in the morning, if deemed requisite, and the bladder be emptied the last thing before anæsthesia be commenced.

Preparatory Arrangements.—A properly trained nurse, experienced in these special cases, who can draw off the urine, record temperatures, administer enemas, attend to any dressings, etc., is absolutely essential. She should take charge of the patient a few days before the operation, so as to carry out any instructions as to preliminary treatment, and also to have everything in readiness. A large airy room, high up for choice, as quiet as possible, should be selected. Thorough ventilation is of the utmost importance.

If possible, a bright clear day, when the wind is not in the east, should be chosen. The time for operation varies with different operators; either early in the morning, from nine to ten, or in the afternoon at three, seems to be preferable.

A strong narrow table about four feet long (an ordinary dressing-table answers the purpose well), another small one being placed crosswise to support the head and shoulders, should be placed somewhat obliquely opposite a window, not too near the wall; a folded counterpane or blanket is placed on this and covered with

a mackintosh sheet, several pillows being handy to raise the head and shoulders as may be deemed requisite. A small table should be placed to the right of the operator to hold instruments, and should be within easy access.

Another larger table, at some little distance, will be necessary for basins and other appliances for cleansing sponges, etc.

All unnecessary furniture, especially curtains and carpets, should be removed from the room. It is advisable to have two small iron bedsteads, three feet six inches wide, with horsehair mattresses upon them, away from the wall, so that the patient can be reached equally well from either side. A plentiful supply of hot and cold water should be in the room. The temperature must be regulated by an open fire, which will also serve for heating any cautery-irons, boiling water, etc. About 65° to 70° F. is a comfortable temperature for the room. A large bath, or several foot-pans or other suitable vessels, will be needed.

At least twenty small sponges, carefully washed and disinfected by ammonia and sulphurous acid (1 in 8), and then in hot water, should be provided; they should be counted both before and after the operation, to prevent the risk of one being left in the abdomen.

A plentiful supply of carbolic acid solution (1 in 40) is necessary. Strips of stout adhesive plaster, two inches wide and about eighteen inches long, should be hung over the back of a chair, ready for use when wanted.

A supply of lint, cotton-wool, carbolized gauze, carbolized oil; a flannel belt, safety pins; brandy, champagne, ice; a small india-rubber enema bottle, laudanaum, a catheter; a feeding-cup, and anything else likely to be required, should be at hand.

Green blinds or some arrangement whereby the room can be darkened after the operation, should not be forgotten.

Everything should be in such readiness, before the patient is brought in, that it may not be necessary to send for anything or to open the door.

A mackintosh apron, with an oval aperture about eight or ten inches by six or seven inches, spread for about an inch round the margins of the aperture with emplastrum plumbi, so as to enable it to adhere to the skin all round, should be in readiness.

A long belt, similar to a horse-girth, will be required to strap the patient's legs, just above the level of the knees, to the table, as also wristbands and straps to secure the hands, or bandages, if this be preferred.

Instruments.—Those required for a simple case are few, but as we never know, until the abdomen be opened, what complications may occur, or how formidable the operation may be, it is better to have everything at all likely to be wanted in readiness, so as to be prepared for every emergency.

In any case it will be necessary to have a steam spray-producer; a scalpel to divide the abdominal wall; a director to protect the cyst as this division is completed; a pair of scissors; a trocar to empty the cyst; torsion forceps and ligatures to secure any bleed-

ing vessels; a clamp to secure, or stout silk cord to tie, the pedicle; a pair of stout dressing forceps; needles and silk to close the wound. Sponges, cotton-wool, carbolized gauze, carbolic solution (1 in 20), and other similar requisites, have been already enumerated. In addition to these, however, it will be safer to have ready on a reserve tray, separate from the instruments already mentioned, needles of different shapes and sizes; ligatures of varying thickness; hare-lip pins or acupressure needles; artery, torsion, bulldog, and other forceps; vulsella and clamp forceps to grasp the cyst; galvanic or other cautery; straight and curved scissors; a tenaculum; wire retractors; an *écraseur*; drainage-tubes; some styptic solution, as the perchloride of iron; a sound to explore for adhesions; a syringe, and anything that the operator may be in the habit of using in the course of the operation.

The operation should always be performed antiseptically, the instruments being placed in metal or porcelain trays and covered with a solution of carbolic acid (1 in 20). The sutures must also be kept immersed in a similar solution, in a separate tray.

Assistants.—One is requisite to administer the anæsthetic. This should be his sole duty.

Another stands on the left-hand side of the table, opposite to the operator, who stands on the right side of the patient, with his right hand towards the light, and if thought desirable, a third assistant takes up his position on the left hand of the operator, and may also attend to the steam-spray from time to time, the nurse, with sponges and other necessary articles, being behind and to the left of the patient. She should have basins with warm and cold carbolized water (1 in 40), to wash the sponges in, ready.

The chief assistant, opposite the operator, with sponge in hand, should be ready to dry the wound during the incision of the abdominal walls, apply torsion forceps or ligatures to bleeding vessels, secure the cyst with clamp forceps after it has been punctured with the trocar, see that the end of the tube attached to the trocar is properly directed into the receiver, support the cyst on its being brought out, replace or prevent extrusion of intestines or omentum, apply a large flat warm sponge to prevent their being unnecessarily exposed, assist in applying sutures to the wound, or anything the operator may suggest. Absolute silence should be enjoined, no officious suggestions or pathological questions being mooted unless specially desired by the operator, whose every want should be anticipated and judgment respected.

Antiseptic Precautions.—The followers of Lister contend that these should invariably be observed in performing an operation that involves such a serious risk as ovariectomy. With the experience recently gained by Thornton and others, of the application of Lister's antiseptic method to the operation under consideration, it would seem hardly justifiable to deprive the patient of the advantages that have been proved to result from the carrying out of this procedure, although recently the system itself has been called in question. In any case it will be well to describe the process.

The steam-spray apparatus should be one capable of playing continuously for at least two hours without the boiler becoming exhausted. A solution of carbolic acid of the strength of 1 in 20 is placed in the jar, so that when diluted with the steam-spray, it will be about the strength of 1 in 40. It should be in perfect working order before anæsthesia is commenced. It is well to have in reserve an extra supply of at least a Winchester quart bottleful of 5 per cent. strength, which must be placed handy, so as to replenish the jar as the solution becomes exhausted. The apparatus should be placed at the foot of the table, and the spray directed on to the abdomen of the patient, so as to envelop the surface in a cloud of mist before the incision is made.

The operator and assistants should wash their hands in carbolic solution (1 in 20), previous to the operation being commenced, and even the abdomen of the patient should also be treated in a similar manner.

Dr. Bantock, Mr. Lawson Tait, and others have recently questioned the advantages attributed to the Listerian precautions, and endeavored to show that pyrexia is more likely to follow antiseptic operations from the absorption of carbolic acid, which is an irritant poison, and prevents the wound healing by first intention. They contend that the use of the spray is not only inefficient, but positively injurious. The great point was strict attention to cleanliness. Success depended more upon the man than the method; as experience increased the mortality diminished.

Bantock says that since he has departed from Listerism, merely using warm water without any carbolic acid, both for the spray as well as for the instruments, he has had better results both as to mortality as well as pyrexia. He regards cleanliness as the most potent factor, and the only true antiseptic system. On the other hand, the evidence of Thornton is entirely in favor of Listerism. He thus summarizes his experience in the following general conclusions: 1. Simple cases recover under Lister's method with a certainty previously unknown. 2. There is less fever, and convalescence is more rapid than under the old method. 3. The success obtained in the more complicated cases is in proportion to the exactness with which the antiseptic method can be applied to the individual cases. 4. The accidents and complications occasionally following operation, such as hæmorrhage for example, are more easily overcome in aseptic cases. 5. There are difficulties and some dangers in the application of the method, and the more experience the individual surgeon has in it, the more readily he foresees and avoids these, and the more complete becomes his success in applying it.

ANÆSTHESIA.—*Chloroform* almost invariably produces distressing and persistent vomiting after the operation, and in long and difficult cases is apt to depress the pulse to a dangerous extent.

Ether often produces an irritating cough, the vapor becomes diffused throughout the room, and it is difficult to induce complete anæsthesia by it.

Chloromethyl, or bichloride of methylin, administered by Junker's inhaler, is by far the safest anæsthetic. It does not produce bronchial irritation, is less depressing, even when administered throughout a prolonged operation, and possesses more advantages and fewer drawbacks than any other form of anæsthetic. It should therefore be employed.

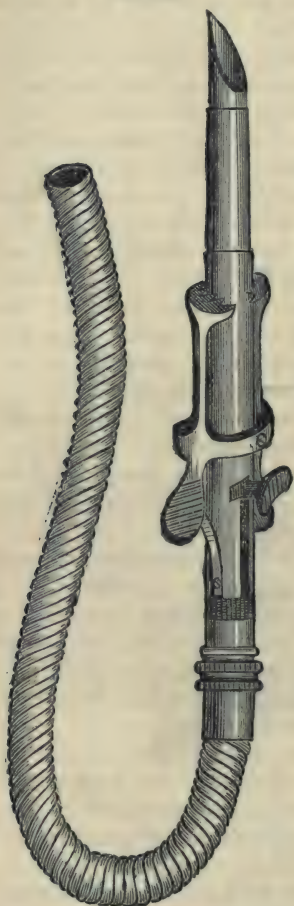
Everything being in readiness, the patient may either be anæsthetized in an adjoining room, and then carried in to the operating-table, or she may be placed in proper position on the table, the instruments being covered over with a towel, and the room temporarily darkened, and anæsthesia commenced. The catheter having been passed, or the bladder previously emptied, the mackintosh apron is applied to the abdomen, the belt is then placed round the legs, the hands secured, the blinds drawn up, the assistants placed in the position assigned to them, and the operation commenced. The administrator of the anæsthetic stands at the head of the operating-table, so as to be out of the way of the operator and his assistants. It is not necessary to keep the patient continuously at the point of narcosis, indicated by stertorous breathing, lividity of lips and face, but merely to produce such an amount of anæsthesia as will render her incapable of experiencing pain. If the operation be very prolonged, it may be prudent to allow the patient to come to a little, and administer a little brandy and water by the aid of a feeder.

The operation of ovariectomy includes the following procedures: Incision through the abdominal walls; exploration for adhesions; tapping the cyst; detachment of adhesions; drawing out of the cyst; constriction of the pedicle; removal of the tumor; examination of the other ovary; cleansing the peritoneal cavity of blood, or ascitic or cystic fluid; securing any bleeding vessels; closure of the incision by sutures; application of dressings.

The incision is made in the median line, three to four inches in extent, from just below the umbilicus to within an inch and a half or so of the pubes. All bleeding should be arrested before the peritoneal cavity is opened, by torsion forceps, which are left hanging outside the abdomen. If any ascitic fluid be present, the peritoneum may bulge through the opening and lead to the supposition that it is a thin-walled cyst; care must be taken to distinguish this, lest the peritoneum be stripped from the abdominal wall on the supposition that extensive adhesions exist. The more solid cyst may commonly be felt behind it. The peritoneum is then opened, and a grooved director inserted in the aperture; a blunt-pointed bistoury being passed, the peritoneum is divided to the requisite extent. If the cyst be adherent it may be well to extend the incision upwards until some point is reached where the cyst is free, and from this point separation of adhesions may be commenced, parietal adhesions alone being dealt with at this stage, adhesions to omentum or intestine, especially those at the posterior part of the cyst, being left until the cyst be evacuated and the adherent viscera can be seen. The hand is carefully inserted between the cyst and the

abdominal wall, palm downwards, to search for adhesions, and if not very tough, to separate or tear them. The cyst is now tapped with *Wells's Cyst Trocar* (Fig. 123), having clamps attached to fix the cyst wall to it. If a simple cyst, the most prominent part is selected; if multilocular, the largest cyst visible. The fluid is conducted into a suitable receptacle by a flexible tube attached to the trocar. As the cyst becomes flaccid the assistant presses the parietes of the abdomen in close approximation to the cyst, so as to prevent any fluid gaining access to the peritoneal cavity, and also to prevent the protrusion of intestines. The cyst is gradually drawn out of the abdomen, either by the hand or by means of *Nélaton's Cyst Forcep* (Fig. 124), any adhesions not already separated being broken down or torn through. Where several cysts are present in the same tumor, they may be tapped successively by pushing the trocar forwards and thrusting it through the septa, or by passing the hand into the cyst first emptied, and so crushing them. Where the tumor proves to be solid, or semi-solid, and too large to pass through the incision, this must be carefully extended.

FIG. 123.



Spencer Wells's Ovariectomy Trocar.

the intestines are seen to be adherent to it, the adhesions should be cautiously detached by the fingers, or divided by the scalpel, or by scissors. Ligatures of carbolized gut or silk may be used to secure any small bleeding vessels, cut short and left *in situ*. Every portion of omentum where adherent to the cyst should be most carefully examined, to see that no bleeding vessel be returned into the peritoneal cavity. If the adherent surface be large, it may be divided into sections, and each one tied separately before dividing the adhesions, or compressed by the clamp-forcep (Fig. 125), until it is decided what shall be done with it.

Adhesions to stomach, intestine, or liver need to be very cau-

The assistant at the operator's left hand receives the cyst in a towel or basin, and supports it until it is completely separated, great care being taken that no traction be exerted either on the pedicle or on any undivided adhesions, and that no fluid gravitates into the abdominal cavity.

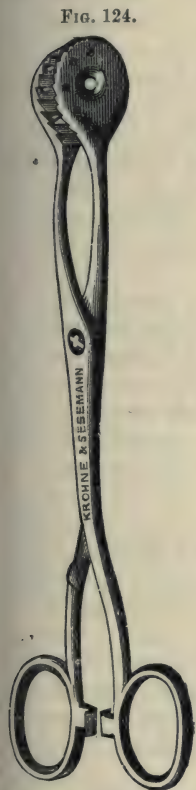
If, while the tumor is being withdrawn, the omentum, the mesentery, or

tiously dealt with. separated without

If the cyst adheres so firmly that it cannot be danger, the adherent portion must be cut out and left attached, the internal secreting membrane being removed. The same method may be adopted in regard to pelvic adhesions, the cyst wall being split into two layers, the outer being left attached and treated as a pedicle by ligature or otherwise.

Should the intestine be injured in any way by the knife, scissors, fingers, or from detaching intimate adhesions, the opening must be neatly stitched up with a fine needle and silk, and the ends cut short.

The Pedicle. — Numerous methods of securing this have been adopted, but they may all be classed under two heads, the *extra-* and the *intra-peritoneal* method. In the *extra-peritoneal* method the pedicle is secured by a clamp (Fig. 126), of which endless varieties have been invented, and then secured in the lower angle of the wound, the tumor being cut away within an inch or so of the clamp. The method is not applicable when the pedicle is very short or very broad. It pos-



Nélaton's Cyst Forcep.

sesses the advantage that the surface, which may bleed or give rise to discharge, is always kept in sight, and the discharges escape externally.

The disadvantages are that the stump strangulated in the clamp may slough and fall back into the abdomen; serious symptoms may arise from traction; the clamp may slip or be forced off by violent retching or coughing; it may fail to arrest hæmorrhage; it prevents the entire closure of the incision, and thus subsequent weakness of the abdominal wall, or even hernia, may result. The clamp necessitates a permanent union of the pedicle with the abdominal walls; this may predispose to internal strangulation of a portion of intestine, and to a miscarriage if pregnancy should occur.

The clamp is often a long time in separating, and not infrequently produces ulceration of the abdominal wall from pressure, which takes a long time to heal.

The *intra-peritoneal* method includes the ordinary plan of securing

Fig. 125.



Spencer Wells's Small Clamp Forcep.

the pedicle by ligatures and other less usual methods of torsion, acupressure, the *écraseur*, and cautery.

FIG. 126.



Spencer Wells's Clamp.

The essential objects in the management of the pedicle are to prevent hæmorrhage from the divided vessels, and to avoid setting up peritonitis or septicæmia by the means employed.

The objections urged against the employment of the ligature are that a foreign body is left in the peritoneal cavity, which is liable to set up peritonitis. If silk or other suitable material be employed, this objection has little or no value.

Again, the ligature is supposed to cause sloughing of the stump of the pedicle, which gives rise to putrid matter and produces septicæmia. This, however, is mere theory; practically, sufficient capillary circulation is established to maintain the nutrition of the stump beyond the seat of ligation, and so prevent any sloughing.

There is certainly some risk that the stump may become adherent to some portion of the intestine, and so lead to intestinal obstruction, but this accident has been met with very seldom.

It was formerly supposed that as the tissues in the pedicle became shrunken, the ligatures would become loose, and either slip off or allow hæmorrhage to take place, but practically, if proper precautions be taken to the contrary, this very rarely occurs.

Carbolized silk or hemp, not too stout, but still sufficiently strong to bear a good strain, forms the best material for ligature. The pedicle is transfixed about the centre of its width, being careful to avoid puncturing any vessel, by a needle armed with a double ligature. This is cut into two equal portions; by twisting the two ends one turn the ligatures will be made to cross each other; one half of the pedicle is then firmly tied with each of these, the two crossing like a figure of eight at the centre. If deemed requisite the whole of the pedicle may then be encircled by one of the ligatures, firmly tied, and the ends either cut short or brought out at the abdominal incision. In any case the ends may be left long and held by an assistant as a guide to the stump, until the other ovary has been carefully examined, the pelvic cavity cleaned out, and all the steps of the operation completed, but great care must be taken that no traction be employed.

The ligatures must be drawn very tightly in tying them, to avoid their slipping. There need be no fear of strangulating the stump so as to produce gangrene. Do not cut the pedicle too near the ligature; leave at least three-quarters to one inch.

If it be decided to leave the ends of the ligatures long, and hanging out of the incision, so that they may be drawn out when they become detached, let the ends be sufficiently long, six or eight inches at least, to prevent their being drawn into the abdomen, if tympanites supervene or any dragging upon the pedicle occur if the patient should happen to turn over.

The time required for ligatures to become detached varies from three weeks to a month, but may exceed this greatly.

The method of cutting the ligatures short, close to the stump, is the one usually adopted.

Where the pedicle is thick and fleshy, and too short even for the ligature to give a secure hold, it may be grasped by the cautery-clamp, and the tumor severed from it by the actual cautery, heated to a dull heat, so as to char down very slowly.

Pocketing the pedicle consists in fastening the extremity of the pedicle between the inner lips of the wound at its lower angle.

In very rare instances no pedicle at all is found, the tumor having broken away from its original connections, and become attached to some portion of the peritoneal surface.

Arrest of Hæmorrhage.—Any vessels that have not previously been secured, when separating or tearing through the adhesions, that are still bleeding, must be secured by carbolized silk ligatures cut short and left *in situ*, by torsion, or by cautery, ligatures being the preferable method. Where there is general oozing from an inflamed or vascular surface, where the peritoneum itself has been detached, and no special vessels can be distinguished, if pressure and exposure to the air fail in arresting the hæmorrhage, swabbing the surface carefully with the perchloride of iron, lightly wiping off any superfluity, may safely be recommended as both efficient and harmless.

If any vessel leading up to the seat of the oozing can be detected, a small silk ligature may be passed underneath it, tied, and the ends cut short.

Where adhesions of the omentum have been extensive, it is well to spread out the omentum on a clean towel, and examine carefully every inch of the torn surface to see that no vessels have been overlooked, and if necessary apply ligatures. All shreds and loose portions of omentum should be trimmed off.

Examination of the other Ovary.—As soon as the pedicle has been secured and the tumor removed, and any omental or other vessels injured during the separation of adhesions (if bleeding) have been tied, the other ovary should be examined.

If the ovary be hardened or so enlarged that disease appears likely to go on, it should be removed, the pedicle being dealt with according to circumstances. A second clamp may be applied, or ligatures, as the case demands.

Cleansing of the Peritoneal Cavity.—The “toilette” of the peritoneum is of the utmost importance. Any ascitic or cystic fluid or blood must be carefully removed by small sponges on holders, otherwise peritonitis or septicæmia may result, these being two of

the most frequent causes of death in fatal cases. If any further bleeding points be detected, or even general oozing, this must be arrested before closing the abdominal wound. The sponges should be passed deep down into the pelvic cavity, in the most dependent parts, where any fluid would be likely to gravitate.

Drainage.—Now that the antiseptic method of operating is resorted to, drainage through the abdominal wound, or through an opening made expressly in the bottom of Douglas's pouch into the vagina, is generally necessary. Still, cases occur in which, owing to extensive adhesions having been present, much oozing of blood or serous fluid may be expected, or where septic or colloid fluid has escaped into the peritoneal cavity, drainage may be considered advisable.

Keith's glass drainage-tube, open at both ends, about six or seven inches long, so as to reach to the lower portion of Douglas's pouch, the lower end being perforated with several holes, is placed tightly between the two lower stitches. The top of the tube is covered by a cup-shaped sponge wrung out of a solution of carbolic acid, one in thirty, a piece of thin sheet india-rubber being wrapped over this. Any fluid which collects in the pouch may be drawn off by a fine india-rubber tube attached to a syringe, night and morning. Disinfectant injections may also be employed if thought necessary. The dressings should be so arranged as to enable the tube to be uncovered without interfering with them. The tube may generally be removed within a few days.

It is especially in those cases where the fluid is of a sero-sanguineous character that drainage is of most service. When blood itself is effused into the peritoneal cavity, coagulation in due course takes place, the serous portion becomes absorbed and the fibrinous clot organized. Where, however, a mixture of blood and serum occurs no such coagulation takes place, the blood-corpuscles undergo a process of necrosis, and septicæmia too often results. Where the effusion is not extensive, the inconvenience of soiling the patient's linen, and consequent necessity for changing it, may often be avoided by passing the outer end of the drainage-tube through a small aperture in a piece of mackintosh sheeting, covering the end with a cup-shaped sponge, and then folding the mackintosh over the sponge, this latter being removed from time to time and squeezed dry.

Experience has not confirmed the plan of drainage through Douglas's pouch and the vagina, with the injection of antiseptic solutions, as a judicious one, and it should therefore not be resorted to.

Another method of bringing the end of the pedicle itself out through an opening in the vaginal cul-de-sac has also been suggested, but does not seem to have met with much consideration.

Closure of the Abdominal Wound.—After having carefully examined every source of hæmorrhage, thoroughly cleaned the peritoneal cavity, and restored the intestines to as natural a position as possible, so as to guard against all twisting of the convolutions

one upon another, a large, broad, flat piece of thin sponge should be inserted just within the wound, so as to cover the intestines whilst the sutures are being passed, and protect the peritoneal cavity from any further hæmorrhage which may follow the passage of the needles.

The sutures may be of wire, silkworm gut, or carbolized silk. Portions of silk, about eighteen inches in length, are previously threaded at each end with strong, straight or slightly curved needles about two inches long.

Each needle is introduced from within outwards, by means of a needle-holder, including about half an inch of the peritoneum, and then brought out near the margin by perforating the whole thickness of the abdominal walls. They should be placed about an inch apart, and not secured until all have been introduced. An assistant holds them as they are inserted, and draws up the margins of the wound. The abdominal cavity is again inspected to determine if any further hæmorrhage continues; a sponge on a holder is passed deep down with a similar object. The protecting sponge is then removed, the sponges counted, the sutures are tied, and the ends cut off.

Where the clamp is employed, a suture should be passed close to the latter, in order to bring the lips of the wound so accurately around the pedicle that the peritoneal cavity is perfectly closed.

Should the abdominal walls be very fat, intermediate superficial sutures may be needed.

Before closing the wound, any air in the peritoneal cavity should be expressed as completely as possible.

Application of Dressings.—The exposed surface of the abdomen is first carefully sponged and dried, and the mackintosh apron removed. If the clamp be used, pledgets of lint soaked in carbolized oil are placed under the angles of the clamp, so as to protect the skin from undue pressure. The surface of the stump is sprinkled with dry perchloride of iron, tincture of iodine, or carbolic acid.

If ligatures have been applied to the pedicle, and the wound closed perfectly, it is unnecessary to apply carbolized oil or oil-silk. The better plan is to cover over the wound with several layers of carbolized gauze. Pads of antiseptic cotton-wool are placed on each side, broad strips of plaster are passed over all, so as to give firm support, and lastly the flannel belt is adjusted, the night-dress pulled down, and the patient lifted carefully on to the bed.

She should be placed on her back, her knees supported by a pillow, the body covered with light but warm blankets, and hot-water bottles provided if she be at all chilly. The room should then be darkened, and the patient left absolutely quiet, alone with the nurse. All instruments should, when practicable, be removed to another room and there washed and dried.

After-treatment.—Success depends upon attention to minute details. The patient is not cured when the tumor is removed; she has yet many risks and dangers to encounter. Numerous precau-

tions will have to be observed, complications and contingencies dealt with and provided for, that will often tax the experience and patience of the operator even more than the performance of the operation itself. Our first care, especially if the operation have been prolonged or the patient much exhausted, will be to establish reaction.

Stimulants such as brandy and champagne should only be used when called for by faintness or chilliness, or some sign of exhaustion, or where sickness is troublesome. A little of one or other of these stimulants in iced soda water may be sipped from time to time from a feeder; or an enema of beef-tea and brandy, not more than two ounces at a time, administered at short intervals. Small pieces of ice to suck will also have a good effect.

A morphia suppository, a hypodermic injection, or a succession of small opiate enemata, left to the discretion of an intelligent nurse, with directions to give only enough to keep the patient free from severe pain, answer better than large doses administered at stated intervals under medical prescription.

Very little food is required during the first three days; milk and soda water, barley water, thin gruel, water arrowroot, chicken or veal broth or beef-tea, may be allowed in small quantities at a time, if sickness be absent and the patient desires them.

The catheter should be passed every six or eight hours for the first few days. If flatulent distention of the bowel prove troublesome, O'Byrne's tube may be passed a foot or more up the rectum, or five grains of quinine in an ounce of water injected every four hours.

If the urine be turbid or scanty, lithia water, or a mixture of the citrates of potash and lithia, should be given at short intervals.

The bowels should not be encouraged to act, even if they do not do so for the first week or ten days, provided no discomfort arise in consequence. If deemed requisite, an enema of salad oil may be administered, and the accumulated fecal mass broken up by the finger or a spoon.

No one but the physician and necessary attendants should be admitted to the apartment during the first three days, even in the most favorable cases.

Surgical Treatment.—As a rule, the dressings need not be interfered with for the first few days unless there happen to be much discharge, when of course this must be attended to. Union generally takes place by first intention.

The sutures should not be removed until the fourth to the eighth day, depending upon the amount of irritation they cause. If any seem to be too tight, they may be divided. In very stout or feeble patients union may be slower; the stitches must then be left in longer. It is well to remove only alternate ones at first, and be guided as to the others by the amount of union that has taken place. If much flatulence exist, or the patient be troubled with a cough, care should be taken not to remove the sutures too early.

Where the clamp is employed, unless there be any soaking of

discharge, the dressings need not be disturbed for the first thirty-six or forty-eight hours. The plaster near the clamp may then be raised and divided, and the stump cleansed, any soiled dressings being changed and replaced by dry lint, fresh plaster being then applied. After this, daily dressing is generally necessary. The abdomen must be supported by plaster for at least a fortnight longer if thought necessary. The clamp and portion of pedicle compressed by it usually fall off from the seventh to the tenth day, but may do so earlier or later.

The patient will need to wear an abdominal belt or binder for twelve months after the operation, to prevent ventral hernia.

Should peritonitis ensue, it must be dealt with on general principles, special care being taken not to allow any accumulation of septic matter to remain deep down in the pelvis or dependent parts.

CHAPTER XXII.

DISEASES OF THE BROAD LIGAMENTS, INCLUDING PELVIC CELLULITIS
AND PELVIC PERITONITIS.

Diseases of the Broad Ligaments, including the cellular tissue and investing peritoneum.—Many different names have been employed from time to time to designate inflammatory conditions affecting the tissues surrounding and covering the uterus and its appendages as well as lining the pelvis.

Of these the terms pelvic cellulitis and pelvic peritonitis are probably best understood. Although we rarely meet with inflammation of the one tissue without the other being to some extent involved in the process, the two being almost invariably associated, one by contiguity lighting up the other, yet the two affections are entirely distinct from each other, and should not be confounded simply because they complicate each other. As Thomas remarks, they may be compared to serous and parenchymatous inflammation of the lungs—pleurisy and pneumonia. Like them they are separate and distinct, like them affect different kinds of structure, and like them generally complicate each other. The terms pelvic cellulitis and pelvic peritonitis are adopted in the nomenclature of diseases approved by the Registrar-General, and as there are certain advantages in describing them separately, we shall for sake of clearness do so, although, after what has been said, the practitioner will understand that the terms are not applied in an exclusive sense, but according as the affection of one or other structure is predominant.

Virchow proposed the term peri-metritis as the equivalent of pelvic peritonitis, and para-metritis as that of pelvic cellulitis, but these terms are open to many objections, which need not be insisted on here, and seem more calculated to produce confusion than to facilitate our understanding of the subject.

Other terms, such as peri-uterine cellulitis, peri-uterine phlegmon, metro-peritonitis, peri-metric inflammation, pelvic abscess, etc., have also been employed to designate one or other of these conditions, or the two conjointly. The term suggested by Dr. Barnes—peri-metric inflammation—includes the two conditions, and is certainly a very appropriate one. When patients speak of inflammation of the bowels, it is generally some form of pelvic inflammation they refer to.

In attempting to estimate the frequency of the two affections, it is difficult to form a correct opinion. A large proportion of the cases often regarded as instances of pelvic cellulitis, are really those of pelvic peritonitis. This latter is more likely to prove fatal than

the former, and therefore the results of post-mortem investigations cannot be trusted to as affording any direct evidence on the question. Pelvic cellulitis is comparatively rare in the non-puerperal patient, while pelvic peritonitis is exceedingly common, so that excluding parturition or abortion, or operations upon the cervix uteri, pelvic peritonitis seems to be the much more common affection.

Pelvic Cellulitis (Para-metritis).—*Definition.*—This consists in inflammation of the cellular tissue surrounding the uterus and other pelvic organs, and extending up between the folds of the peritoneum which form the broad ligaments of the uterus. This connective tissue exists in abundance between the vagina and rectum, between the uterus and bladder, passing by continuity upwards into the iliac fossa and along the surface of the psoas muscles posteriorly, and between the peritoneum and transversalis fascia anteriorly. Between the anterior and posterior surfaces of the uterus and the peritoneum, the amount of connective tissue is so slight, that its presence even has been doubted, but at the sides and at the cervix distinct loose cellular tissue exists.

It is, however, between the folds of the peritoneum constituting the broad ligaments that the cellular tissue is most abundant, and that inflammation is most frequently met with.

Pathology.—In an ordinary case of pelvic cellulitis we have first a condition of congestion producing intumescence or swelling from effusion of serum or exudation of lymph into the areolar tissue. This may terminate by resolution, or go on to suppuration and the formation of an abscess. In some rare cases the tissue involved becomes destroyed and sloughs, as seen in cases of anthrax and phlegmonous erysipelas. In the very early stage of the affection, the infiltration of serum produces a swelling somewhat elastic to the touch.

Where the exudation of lymph occurs, the most notable characters of the swelling are its hardness, irregularity, and immobility, as if plaster of Paris had been poured in and become consolidated, fixing the uterus immovably.

When suppuration occurs, which does not usually take place for at least ten or fourteen days after the onset of the attack, even in acute cases, the presence of fluctuation may be so masked by the surrounding exudation, that it is almost impossible to determine whether pus be actually present, or the pus may escape per rectum or vaginam before its presence has been detected.

Suppuration at first may be only circumscribed and not diffuse; or there may be two or three centres of suppuration, pointing in different localities, each abscess having a separate opening, and bursting at different times; or suppuration may be more general, resulting in the formation of a large pelvic abscess by the breaking down of the intervening barriers, which at first served to circumscribe the several collections of pus. In some instances these pelvic abscesses are of enormous size, filling up the pelvis and extending almost as high up as the umbilicus.

Causation.—In by far the larger number of cases of pelvic cellulitis it follows as a consequence of parturition or abortion, more especially where there has been any traumatic injury, as laceration of the cervix uteri, as not infrequently happens in cases of instrumental delivery, or where turning has been resorted to, or the perineum ruptured.

Primiparous patients are more liable to pelvic cellulitis, probably from the greater protraction and difficulty of first labors. The head being allowed to remain impacted in the pelvis for many consecutive hours, producing such an amount of bruising and pressure upon the maternal soft parts, the cervix and cellular tissue; the increased risks of laceration of the cervix, and rupture of the perineum, and the increased risk of septic absorption, are quite sufficient to explain this.

The fact of the occiput being directed to the left side of the pelvis, as happens in the first presentation, the left occipito-cotyloid, may explain the occurrence of cellulitis being more common on the left side. Patients who do not suckle are supposed to be more prone to develop cellulitis than those who nurse their offspring.

Lying too long in the soiled linen after parturition, before being changed, getting up too soon after delivery, and resuming household cares, sitting on draughty water-closets, the injudicious use of the vaginal douche, or exposure to cold, too early indulgence in coitus after abortion or parturition, and other imprudent actions, are often fertile sources of pelvic inflammation.

It is a question whether pelvic cellulitis in the non-puerperal state can occur idiopathically or independently. The tendency of recent investigations is rather to show that it is secondary to antecedent acute inflammation of the uterus or its appendages. Among the more usual exciting causes may be mentioned the employment of strong vaginal injections; sudden suppression of menstruation from cold or other causes; the employment of the syringe with cold water immediately after coitus, with a view to preventing conception, more especially just before or after the menstrual period; immoderate coitus, particularly when there has been some pre-existing uterine disease; mechanical injuries either from accident or surgical interference; the use of laminaria or sponge tents, or intra-uterine pessaries, the application of caustics to the cervical canal, injections of styptic or other irritating solutions into the uterine cavity, the injudicious or rough use of the uterine sound division or amputation of the cervix uteri, attempts to enucleate uterine fibroids. Gonorrhœa, malignant disease of the uterus or its appendages or of the rectum, or any operations, such as the ligature of hæmorrhoids, etc., may also set up pelvic cellulitis.

Symptoms.—These will vary somewhat, depending upon whether the attack be acute or slow and insidious.

The acute form is generally ushered in by a distinct chill or rigor, followed by fever, rapid pulse, 120 to 130, full and bounding elevation of temperature, 103° or 104° F., hot skin, flushed countenance.

tenance, furred tongue, headache, vomiting; pain and tenderness in one or other iliac region or in the hypogastrium, increased on movement, or on attempting to sit upright or walk; a sensation of fulness and pressure, often spoken of as bearing-down or dragging pain; dysuria, frequent desire to micturate, with tenesmus, or an unsatisfied sense of the bladder not being emptied; urine scanty and loaded with lithates and mucus; constipation or difficulty in defæcation may alternate with a kind of dysenteric diarrhœa. The secretion of milk is generally lessened or may be altogether arrested, the lochia are usually suspended, though occasionally menorrhagia occurs. Excessive sweating on awakening from sleep is a very characteristic symptom of cellulitis.

The chronic or subacute form commences so gradually and insidiously as often to escape observation, until when the patient begins to get about it is suddenly kindled into activity. There may be no distinct rigor or pyrexia to indicate when the mischief began, the patient is somewhat feverish towards the evening, does not recover her appetite or strength, feels nervous and depressed, complains of deep-seated uneasiness in the pelvis, increased on micturition, defæcation, or standing, when it becomes more acute, and is described as shooting and lancinating, with a feeling of tension and weight in the perineum and lower extremities. At other times it is described as pulsating and throbbing. The pain often assumes a periodic character, returning in distressing paroxysms, and occasionally in severe nightly exacerbations.

Physical Signs.—If a vaginal examination be made in the very early stage, there will generally be found increased heat, puffiness, extreme sensitiveness, with possibly evidence of some localized swelling or œdematous spot, which feels somewhat soft and elastic. But this stage is of very short duration, and our first examination may reveal the presence of a hard, brawny infiltration, occupying the roof of the vagina, fixing the uterus and obscuring the cervix uteri, which is merged as it were in the surrounding induration.

The amount of inflammatory deposit varies considerably. In some instances it is localized, being more or less limited to the posterior cul-de-sac, or to one or other side, pushing the uterus over to the opposite direction, and interfering with its normal mobility, although it may be possible to move the uterus together with the swelling: this, however, is rare.

Where the effusion is more general, the uterus will be found fixed in the centre of the pelvis, on a lower level than natural, or it may be pushed over to one or other side, pressed back into the hollow of the sacrum, or carried upwards and forwards under the arch of the pubes, compressing the neck of the bladder and causing retention of urine.

The displacement may be so great, and the amount of effusion so extensive, as to effectually preclude our detecting any portion of the cervix, or even feeling the os uteri.

If possible, the conjoined manipulation should be resorted to, in order to determine the direction and amount of the effusion; but

this must be done with extreme care, for the parts are often so tender and sensitive, the vagina so narrowed and distorted by the surrounding deposit, that only the gentlest vaginal examination is tolerated.

Rectal exploration here often proves of much service, enabling us to extend our investigations considerably above the level of the os uteri and the lower margin of the inflammatory swelling, as also in determining whether the tissue around the rectum is involved, as not infrequently happens, the adhesive effusion forming a collar through which the rectum passes. In other instances the bulk of the effusion being limited to Douglas's pouch, the rectum is compressed against the sacrum. In cases of post-partum pelvic cellulitis, the swelling often extends upwards to one or other inguinal or iliac region, or across the hypogastrium above the brim of the pelvis, as evidenced by the dulness on percussion, tenderness on pressure, sense of hardness and resistance on pressure over the lower abdomen, and also by the communicated impulse on conjoined manipulation.

Differentiation.—The history of the onset of the attack following parturition, abortion, or some operation will serve to put us on our guard. From puerperal fever and general peritonitis following labor, the fact of the constitutional disturbance being of a less severe character, and the localization of the symptoms more marked in cellulitis, together with the progressive development of the symptoms, will usually enable us to distinguish the different affections.

From pelvic peritonitis it is often impossible to differentiate cellulitis. The two forms of inflammation are so commonly associated, the one rarely occurring without being complicated with the other, and the treatment for both is so similar, that any repeated or minute examination is more likely to prove detrimental to the patient than is justified by any good we are likely to derive. Peritonitis more frequently results from cold or exposure during menstruation, from disease of the ovaries, escape of fluid into the peritoneum, or from extension of gonorrhœa. The tumor is generally confined to the true pelvis; there are more or less distinct hard prominences to be felt; suppuration is less frequent, and there is seldom retraction of the thigh in the more chronic stage.

Malignant deposit around the uterus may be mistaken for cellulitis. In cases of cancer the cervix is generally involved, hard and nodular or ulcerated, and bleeding readily on touch; the history is one of insidious disease not accompanied by febrile action; the deposit is more uniform, surrounding the cervix entirely; the cancerous cachexia, offensive discharge, and severe pain, especially at night, will all assist us in forming an opinion.

Pelvic hæmatocele occurs suddenly, generally at or about a menstrual period; prostration, syncope, collapse, or other indications of loss of blood occur; the tumor is soft and fluctuating at first, and hardens as time goes on. The febrile disturbance and signs of local inflammation supervene upon, not precede, the effusion in the pelvis.

In pelvic cellulitis there is generally the history of its following parturition, abortion, or operation; the swelling is hard at first, and may soften later on; febrile disturbance is present at the commencement; there is seldom evidence of shock or collapse, but the attack commences gradually.

Extra-uterine gestation may be distinguished by the history of amenorrhœa and other signs of pregnancy, the spasmodic pains, absence of fever, gradual growth of the tumor, irregular hæmorrhages, etc., as mentioned under this heading. Should rupture of the fœtal cyst occur, the symptoms are those of hæmatocele, not of cellulitis.

Later on the spontaneous discharge of an encysted fœtus may give rise to doubt, but the history will generally guard us from error.

Fibroid tumors are attached to the uterus, generally movable with this organ, of which they form a part. They are of slow growth, painless, circumscribed. There is no history of febrile disturbance, but generally of menorrhagia.

Retro-version or -flexion of the uterus may readily be determined by the introduction of the sound; but when a small ovarian, or a fibroid tumor, or a retroflexed uterus is bound down by inflammatory adhesions and deposit in the posterior cul-de-sac, especially if any recent inflammation be present, the diagnosis is often very difficult. The sound will at once distinguish the retroflexion, and on careful conjoined manipulation the ovarian cyst may be detected by its tenseness and elasticity.

Fæcal accumulation or impaction may prove a source of error; examination *per rectum* will obviate this.

Abscess in the pelvis from caries of the vertebræ, or of the pelvic bones, or in connection with the cæcum or rectum, perityphlitis, etc., must be made out by the antecedent and general symptoms of these conditions.

Progress.—Whether the attack be acute or chronic, as soon as exudation of lymph has taken place into the cellular tissue we shall find other symptoms superadded. Pains of an anomalous character are often complained of, due to the pressure of the effused products on the nerves passing through the pelvis, viz., the external cutaneous nerve, the crural nerve, or the great sciatic nerve. Depending upon which of these is chiefly involved will be the fact of the pain being referred to the knee, dorsum of the foot, back of the thigh, etc. Sciatica is not infrequent. Neuralgic pains or other evidence of perverted nervous influence, such as a sensation of coldness or increased warmth, or of hyper- or an-æsthesia may also be experienced.

Flexion and adduction of the thigh are frequently noted, causing the patient to limp, or preventing her getting the heel to the ground, and so causing lameness. Edema of one or other leg, simulating or even running into phlegmasia dolens, is not infrequent whenever the inflammatory action is extensive enough to involve the trunks of the large blood-vessels which proceed to the

lower extremities, when thrombosis of the veins results. In these cases it is important to insist upon prolonged rest to avoid all risk of pulmonary embolism.

The rectum is variously affected by the exudation in the pelvis. Bearing-down and pressure, with pain and difficulty in defæcation, are not infrequent symptoms. There may be incessant desire to go to stool; the fæces may be flattened into thin bands like ribbon; the irritated intestinal mucous membrane may exude so much half-purulent mucus, occasionally tinged with blood, that it may erroneously be taken for a discharging abscess; or obstinate constipation may alternate with dysenteric diarrhœa, which often proves severe and exhausting when an abscess opens into the bowel.

In many cases the bladder is seriously implicated, producing frequent and painful micturition, and as the urine frequently contains pus, the symptoms are liable to be attributed to chronic inflammation of the bladder. A careful consideration of the symptoms, together with a local examination, will generally enable us to differentiate the two and to determine that the bladder-affection is only a secondary complication of a more general pelvic inflammation. Incontinence of urine may occur in some cases from the bladder being bound down by adhesions. Retention may also precede the bursting of an abscess into the rectum or vagina, or into the bladder itself.

There is generally more or less muco-purulent discharge due to congestion of the cervix uteri and vagina. Menorrhagia or metrorrhagia are less frequent.

Terminations.—Where suppuration occurs the pus may find exit through one of the channels shortly to be indicated, the sac of the abscess gradually contracting and ultimately healing; or it may go on discharging for an almost unlimited time; or several small abscesses may burst at various places, leaving fistulous tracts that are extremely difficult to heal.

It should not be forgotten, however, that suppuration is only one of the results of cellulitis, pelvic abscess may result the same as empyema in cases of pleurisy, but every case of this does not end in empyema, nor does every case of pelvic cellulitis end in the formation of pelvic abscess.

It may be stated generally that in the non-puerperal state termination by resolution is the rule, although the induration may remain for some considerable time, and the adhesions contracted among the various pelvic organs may be detected months after the patient is to all appearance perfectly well; whereas, in cases following delivery and abortion, suppuration occurs in at least half of them, if not in a still greater proportion. The termination in suppuration is liable to be overlooked, for the pus escaping *per rectum* or *per vaginam* may not be noticed, and the case be regarded as one ending in resolution.

In puerperal cases the most frequent seat of evacuation is through the abdominal wall, generally above Poupart's ligament, in one or other groin or iliac region. Next in order of frequency comes that

through the rectum or vagina, more rarely into the bladder, beside the anus, through the obturator or sacro-ischiatic foramina, the saphenous openings, and, fortunately rarest of all, into the peritoneal cavity. In some exceptional cases there seems no tendency to burst at all, the abscess remaining encysted for very long periods.

In the non-puerperal variety it is extremely rare for an abscess to discharge externally; the evacuation most frequently takes place through the rectum or vagina, though the fact of the pus escaping gradually may prevent its being noticed, or it may not be distinguished from the other discharges.

Prognosis.—This should always be guarded, as it is almost impossible at first to foresee the various contingencies, complications, and dangers.

Where the patient has previously been in a fair state of health, the symptoms are slight, and the effusion of serum or lymph is only moderate in extent, termination by resolution may be anticipated, the swelling soon disappearing. When the amount of the exudation is considerable and the deposit dense, the powers of locomotion may be impaired for many months, and convalescence tedious and prolonged. Should pregnancy occur under these circumstances it is very liable to be cut short, the adhesions interfering materially with the growth and expansion of the uterus. A more usual result is sterility. The dangers are greater, as a rule, in puerperal than in non-puerperal cases, abscesses being more likely to occur, though the danger of bursting into the peritoneum is greater in the non-puerperal than in the puerperal forms of pelvic cellulitis. This, however, is only exceptional. Unless suppuration is very extensive or prolonged, or other complications are added, evacuation generally takes place either by spontaneous or artificial opening, and recovery ensues. In some instances the discharge continues for a long period after the bursting of the abscess, often through long, inaccessible sinuous tracts, thus wearing out the patient's powers or proving the exciting cause of the development of tubercular disease. Where the abscess opens into the colon or rectum a constant exhaustive dysenteric kind of diarrhœa is kept up, and is little amenable to treatment. The reproductive apparatus is often irreparably damaged by destruction of the ovaries, occlusion of the Fallopian tubes, or displacement of the uterus.

Septicæmia may also result, or thrombosis of the veins, with the risk of pulmonary embolism.

A permanent state of ill-health is often induced, the appetite and digestion are impaired, the nutrition defective, sleep disturbed, the temper irritable, and the mind enfeebled. The demand for opiates in some form or other, and in augmenting doses, increases. The patient's life is one of constant suffering, neuralgic pains often occurring in severe paroxysms during the night.

If the ovaries happen to be involved in the exudation, nausea and sickness are apt to occur, adding greatly to the patient's discomfort. The bladder may also become affected by the extension of inflammation and prove a source of additional suffering. The

patient thus becomes a permanent invalid, or finally succumbs to some form of tuberculosis.

Treatment.—Prevention is proverbially better than cure. Much may be done in this direction by avoiding exposing patients to the causes already enumerated as most likely to give rise to cellulitis. The influence of long-continued pressure of the foetal head in the maternal passages during parturition was formerly a most potent cause of sloughing and the formation of vesico-vaginal fistulae. Although unfortunately cases are still allowed to occur, they are by no means so frequent at the present day. Yet there is little doubt that the well-being of many a parturient patient is jeopardized by allowing the foetal head to remain impacted in the pelvis for many consecutive hours. A timely resort to the application of forceps would effectually prevent much subsequent risk. The careful management of the perineum during the expulsion of the head and shoulders, so as to avoid rupture; preventing the patient getting about too soon after delivery; or returning to the marital couch too early after a miscarriage, and many other similar preventive measures, may well be insisted on by the practitioner as conducive to the safe recovery of the patient and the prevention of inflammatory mischief.

In non-puerperal cases the avoidance of surgical operations where inflammatory mischief of the pelvic organs already exists, unless some urgent necessity for so doing is manifest; extreme caution before resorting to intra-uterine medications, whether the application of escharotics, the insertion of laminaria or sponge tents, or the introduction of stem pessaries; and the avoidance of everything likely to set up inflammatory mischief, may serve to limit the number of cases in which cellulitis often occurs.

Operations that are tolerated shortly after the menstrual period, if performed just before the period is due, are more likely to be followed by inflammatory mischief.

Where gonorrhœa, either in its latent or more active form, is even suspected to be present, the mere passage of the uterine sound or the most trivial operation may prove sufficient to set up such an amount of irritation as will take weeks to allay.

In cases where the symptoms point to an acute attack of pelvic cellulitis, our first care on the occurrence of a chill will be to put the patient to bed; to apply warmth to the body, hot-water bottles to the feet, to administer some warm drink, to which some stimulant may be added if thought requisite; to cover the lower part of the abdomen with some hot fomentation, either flannels or spongio-piline, wrung out of hot water, or with linseed meal or bran poultices.

When reaction has been established, and pain and general feverishness are the chief indications, a saline mixture of the liquor ammoniæ acetatis, citrate of potass and tincture of aconite (mij-ij) every three or four hours, may be prescribed, or if sickness be present, an effervescing saline may be substituted.

To relieve the pain which is generally at this stage the most

prominent indication, opium in some form is generally requisite; a starch and laudanum (℥xx to ℥xxx) enema, the hypodermic injection of morphia, poppy-head fomentations to the abdomen, or better still a piece of linen of the requisite size saturated with laudanum, placed next the skin, the hot fomentation being applied over this, will generally answer the purpose. As far as possible, avoid giving opium by the mouth at this juncture, and even be careful in commencing hypodermic injections, lest the patient insist on their frequent repetition, which will necessitate personal attention on the part of the practitioner every four hours.

Now will arise the question of depletion. General blood-letting will rarely be indicated. Leeches may be applied to the lower part of the abdomen, or around the anus, in numbers varying from three to twelve, depending upon the urgency of the symptoms, the strength of the patient, and the nature of the case. It is better to err on the side of applying too few than too many, for the bleeding may be encouraged subsequent to the falling off of the leeches by hot fomentations, or more leeches may be applied if thought requisite. Temporary relief generally ensues, but in many instances it is a question whether this is not too dearly purchased. The patient will need all her powers; she is probably in a depressed state of health at the time of the attack, and may have to go through a very prolonged illness. This should always be borne in mind.

It is rarely advisable to apply leeches to the cervix uteri in acute cases, because the pain and tenderness preclude the use of a speculum or leeching-tube.

The next perplexing question the practitioner will have to solve will be that of whether he shall administer mercury or not. Opinions differ widely as to the propriety of its employment. Some contend that in combination with opium it seems to act as a direct sedative to inflammatory action; to lessen the tendency to plastic exudation, and to promote absorption. A pill of one or two grains of calomel with half a grain of opium; or a combination of gray powder (gr. iij), with Dover's powder (gr. v-x); or blue pill (gr. ij) with extract of opium (gr. ss) may be given every four or six hours for the first twenty-four hours, and then every six or eight hours for another day or two, the effect being carefully watched lest ptyalism or irritation of the bowels be produced, two conditions carefully to be avoided.

If considered undesirable to give mercury by the mouth, a mixture of equal parts of mercurial and belladonna ointment may be smeared on lint and applied to the lower part of the abdomen.

It is comparatively seldom, however, that we shall be called upon to give mercury with a view to influencing the system in the majority of the cases met with at the present day.

Dr. Emmet, of New York, with a view to cutting short an attack, advises the continuous employment of hot-water vaginal injections, continued, if possible, for hours. He says it is the only means we possess for aborting an attack of pelvic cellulitis, which it will do if thoroughly employed at the beginning.

The continued action of hot water is to stimulate the circulation in the pelvis, so that the local congestion may be relieved before nature attempts to do so by the exudation of serum into the surrounding tissues. The temperature of the water must be elevated rapidly from that of blood heat to 110° F., or to as high a degree as can be borne by the patient. The injection should be often repeated. The nozzle of the syringe must be of horn or ivory, or covered with a piece of india-rubber tubing, to prevent it causing discomfort by coming in contact with the outlet of the vagina.

In the more chronic and diffuse forms of inflammation, characterized by want of power or of septic origin, it is generally better to avoid mercurials and depletion altogether, and to rely solely upon opium, which relieves pain, diminishes the severity of the inflammatory process, keeps the bowels constipated, produces sleep and creates general nervous quietude. Quinine may often advantageously be combined with this.

Where obstinate nausea, hiccough or vomiting occur, it may be necessary to suspend other remedies for a while until the stomach grows less irritable, and give small doses of hydrocyanic acid, bismuth, pepsine, creasote, ice, soda water, effervescing salines, etc. Mustard poultices may be applied to the epigastrium, or even a blister. A hypodermic injection of morphia and atropine may succeed when other means fail. Should the vomiting prove very persistent, it may be necessary to administer nutrient enemata.

To allay the thirst usually experienced, potash or soda water, seltzer, barley water, toast water, or milk and soda water iced, may be given in small quantities at a time.

In any case the diet must be simple and unstimulating, consisting of milk, broth, beef-tea, jelly, arrowroot, and similar things.

After the first acute symptoms have somewhat subsided, whilst the effusion is becoming organized, before it passes on to suppuration or to chronic induration, a blister may be applied over the hypogastrium, or a surface of about four or five square inches painted over with the blistering fluid and kept open with savine ointment, or with the French tissue-plaster known as "albespeyres."

Should the blistering tend to provoke distressing and persistent strangury, as is apt to occur in some sensitive women, it will be better to resort to the linimentum iodi or other form of irritant.

The bromide and iodide of potassium, combined with some bitter infusion or tincture, such as cinchona, calumba, or quassia, may now be given.

Chloral, hyoscyamus, or Indian hemp may be tried in place of opium at bed-time to procure sleep, if the pain be not severe; but if this latter be a prominent symptom, some form of opium answers best.

A vaginal douche of hot water, night and morning, may be of service in stimulating absorption, a small quantity of tincture of iodine or of common salt being added to the water if deemed advisable.

Warm baths, or, failing these, hip-baths, will also prove of ser-

vice in allaying pain, quieting inflammatory action, and inducing refreshing sleep.

The bowels will need to be carefully regulated, and the simpler the means employed the better.

A little syrup or confection of senna (5j); the pulv. glycyrrhizæ co. (5j in milk); tamar Indian; castor-oil (5j every morning); equal parts of sulphur and bitartrate of potass made into a confection with honey, of which a drachm or more may be taken when requisite; small quantities of the natural aperient waters, or anything that is found by experience to suit best, may be taken. An occasional pill of a grain or two of calomel, or blue pill combined with pil. rhei co., or the colocynth and hyoseyamus pill, or one of aloes, nux vomica, and rhubarb, is often of service.

If enemas be resorted to they must be given only by some experienced person, and then with great care, only the simplest and least irritating being employed, such as a couple of ounces of olive oil beaten up with the yolk of an egg and blended with half a pint or so of warm water. If castor-oil be added, one or two tablespoonfuls will be ample.

During all this time the most absolute and perfect rest possible must be enjoined, the patient not being allowed to sit up in bed for a single moment on any pretext whatever. Apart from any fear of pulmonary embolism from dislodgment of some venous clot, there is always a risk of inducing a relapse if the patient be allowed to get up too soon. She will need also to be extremely careful in resting up at what should be, or what is, the catamenial period, for many months afterwards, to avoid relapse.

Occasional blisters to the hypogastrium, painting with iodine, the continual application of spongio-piline wrung out of hot water, or poultices, may be persevered with.

Treatment of Pelvic Abscess.—On the first indication of suppuration having taken place, every effort must be made to sustain the vital powers. Animal broths, milk, malt liquors, wine or spirits if requisite, or even solid food if the patient can digest it, such as chop, chicken, sweetbread, game, or anything that the patient can fancy, may be given.

A mixture of quinine and hydrobromic acid, or acid and bark, or the citrate of iron and quinine, should be prescribed. Where cod-liver oil can be taken it proves very serviceable.

Fomentations and poultices will need to be sedulously applied.

A pill of quinine and opium at bedtime, or some other appropriate form of opiate, will generally be needed.

As to the propriety of opening pelvic abscesses, opinions differ. There is no universal rule for practice in this matter, but as rupture is the only alternative, and this may involve important structures or even cause death by rupture into the peritoneal cavity, the expediency of making an opening must be determined by the urgency of the symptoms, by the progress and duration of the case, by the accessibility to puncture, and by the probabilities of early spontaneous evacuation taking place.

It will be well in any case where the least doubt exists to employ the aspirator trocar at first, our subsequent plan of action being guided by the results obtained. In cases of hard, inelastic pelvic tumors, due to the thickened, indurated condition of the cyst wall, where owing to the excessive distention fluctuation cannot be detected, and yet the history points plainly to the presence of pus, the employment of the aspirator trocar is indicated.

In those cases where the abscess is near the surface, and fluctuation can be plainly detected either *per vaginam*, *per rectum*, or in the lower abdomen, we need have no hesitation in opening it.

If fluctuation be detected at the roof of the vagina, puncture may be made by a long, sharp-pointed hernia knife, or by a long trocar. A long curved trocar is very convenient for tapping the abscess *per rectum*. If pointing take place in the hypogastrium, an incision may be made with a bistoury or a Syme's knife.

The insertion of a drainage-tube, to keep the opening patulous and facilitate the discharge of pus, is sometimes requisite where the opening has been made *per rectum* or *per vaginam*. A winged male elastic catheter or a Sayre's coil drainage-tube will answer the purpose.

The best point for evacuation will be that to which the abscess is nearest, or the surface from which it is most easily accessible and the pus can most readily drain away after operation.

Where a choice exists, the skin over the abdominal walls is possibly the most desirable, failing that, the vagina, and last of all the rectum.

Mode of Operating.—If there be no special reason to the contrary, it will generally be better to give the patient some anæsthetic before operating, in order to secure perfect quietude, more especially if the opening be made internally. Antiseptic precautions should be employed.

If the abdominal wall is the point of selection, the patient should be inclined towards that side on which the opening is to be made, so as to facilitate the exit of the pus.

If the vaginal *cul-de-sac* be the channel chosen, the patient may either lie on her back or in the ordinary obstetric position on her left side, with the hips close to the edge of the bed, depending upon the convenience of the operator. The aspirator trocar is then passed carefully along the vagina, guided by the finger until the point is opposite the site selected for the opening. The trocar is then plunged in, and any fluid contents aspirated.

Should it be thought desirable to extend the opening to allow of free exit of pus, a bistoury or long, sharp-pointed hernia knife may be passed up and the requisite incision made, or a laminaria tent inserted.

In opening abscesses *per rectum*, the long curved rectal trocar may generally be employed. The point of the trocar being withdrawn in the canula until the spot selected is reached, the point is thrust suddenly out and the instrument pushed into the sac, the trocar being then withdrawn and the pus allowed to gain exit.

After first opening the abscess it is doubtful whether it be a prudent plan to inject the sac with a view to washing it out, either with warm water or some disinfecting solution, such as iodine, carbolic acid, Condy's fluid, etc., for fear of breaking down any adhesions, and so allowing pus to gain entrance to the peritoneal cavity. Later on, when the sac shows no disposition to close but goes on pouring out large quantities of pus, which produces much exhaustion of the patient, the injection of some astringent lotions is often necessary. Of these tincture of iodine (5j-iv ad 5j); carbolic acid (1 in 40); sulphate of zinc (gr. ij-x ad 5j); chloride of zinc (gr. ij-x ad 5j); or other agent may be injected and allowed to flow out again.

Where air or fæces gain access to the sac from the bowel, or urine from the bladder, a counter-opening must be made to allow the free escape of all accumulations, and other means resorted to, where possible, to cure the fistulous tracts.

Pelvic Peritonitis (Peri-metritis).—*Definition.*—Where inflammation affects the peritoneum covering the female pelvic viscera, and is strictly limited to the pelvis, rarely passing into general peritonitis, it is spoken of as pelvic peritonitis.

Frequency.—Although proved by post-mortem examinations to be a very common affection among women, it is one that is very generally overlooked.

Many of the anomalous attacks of cramp, pains, and colics occurring at the time of menstruation, producing a certain amount of febrile disturbance, and necessitating a short rest with hot fomentations and other domestic remedies, are really instances of pelvic peritonitis.

Pathology.—In the very early stage of the affection we have simple engorgement and turgescence of the vessels, producing redness, dryness, and pain. The membrane has lost its glistening smoothness, it looks villous or granular, owing to intense vascular injection. It is bright with punctate, stellate, and arborescent injections, and often uniformly red.

In the second stage we find a collection of yellowish plastic lymph, which is quickly thrown out over the whole inflamed membrane, gluing opposing surfaces together. Serous or sero-purulent fluid is also effused. The semi-fluid lymph gravitates into Douglas's pouch, ultimately becoming consolidated into a firm dense mass, binding the uterus and its appendages, as well as the intestines overlapping the brim of the pelvis together. This constitutes the third stage.

A considerable quantity of serum is often poured out in the spaces left between the coils of intestine and the pelvic viscera, forming a more or less circumscribed tumor, often simulating a true cyst, and spoken of as encysted serous peri-metritis. In some rare cases the contents are purulent, and may remain in a state of quiescence for very long periods, though as a general rule the collection bursts into the rectum or sigmoid flexure, or possibly into the vagina, still more rarely into the bladder, and very seldom

indeed into the general peritoneal cavity. Perforation of the external abdominal wall is far less frequent in this variety than in abscess from cellulitis.

Purulent collections are occasionally found in the ovary, and even one or other Fallopian tube may be distended with pus.

Where septic infection was a well-marked factor in the production of the peritonitis, the lymph is often of a semi-fluid, pultaceous, flocculent, or even purulent character, with little or no plastic property, the adhesions readily breaking down. Where recovery ensues the deposit of lymph becomes gradually absorbed, the adhesions becoming stretched and thinned to allow of the movements of the intestines; in other cases they shrink and so distort the uterus, by the gradual traction exerted, or bind the fimbriated extremities of the Fallopian tubes in such a position that the requisite passage of the ovum is interfered with, and sterility results in consequence.

Causation.—In a large proportion of cases, pelvic peritonitis, whether acute or chronic, is secondary to or symptomatic of diseases of the uterus, Fallopian tubes, ovaries, or pelvic cellular tissue. It may, however, occur as a primary affection, appearing suddenly, as when irritating fluid escapes from the fimbriated extremity of the Fallopian tube, as in some cases of intra-uterine injection; from bursting or perforation of an ovarian cyst or abscess; from rupture of the uterus or of an extra-uterine gestation cyst; from effusion of blood into the peritoneal cavity, as from an over-congested Graafian follicle, or from regurgitation of obstructed menstrual blood; from perforation of the intestine, of a dermoid cyst, etc. Cases not infrequently occur from sudden impression of cold, analogous to cases of pleurisy and pericarditis, especially after parturition. A knowledge of this fact should make us extremely careful in resorting to cold-water injections, the application of ice or the cold douche to the abdomen in cases of post-partum hæmorrhage, or of allowing the patient to remain long lying in the wet linen, or of exposing her unnecessarily to cold.

In many of the puerperal cases, antecedent metritis or cellulitis from traumatic injury, or septic infection, is usually the starting-point of the pelvic peritonitis.

It may, however, be part of a general peritonitis due to some zymotic poison, as scarlatina or erysipelas.

Gonorrhœa is a very frequent cause, the inflammatory process extending from the vagina to the cervical, and thence to the uterine mucous membrane, passes up the Fallopian tubes, producing salpingitis, thence to the peritoneum. The ovaries are generally involved in the process. It is this form of inflammation that is so frequent in *puellæ publicæ*, and accounts largely for the fact of their generally being sterile.

Latent gonorrhœa will explain many of the obscure cases of peritonitis occurring in newly-married women.

Imprudence during menstruation, sudden suppression from cold sexual excess just before or after this period, will account for some few cases.

Tubercular or cancerous deposition in any of the pelvic organs may produce secondary inflammation.

Where obstruction to the free exit of the menstrual secretion occurs, as in cases of stenosis and acute flexions, we may have reflux of blood through the Fallopian tubes and peritonitis as a consequence.

In certain states of the general system, unforeshadowed by any recognized peculiarity, the most trivial operation has been speedily followed by fatal peritonitis. Even the passage of the uterine sound for the replacing of the uterus, or the application to the cervical canal of some escharotic, may be sufficient, or the insertion of an intra-uterine stem, a laminaria or sponge tent.

Symptoms.—These will vary, depending upon whether the attack is acute or chronic, secondary to some antecedent inflammation of the pelvic organs.

An acute attack may be ushered in by some feeling of chilliness, but is seldom marked by a severe rigor, as generally occurs in cellulitis. There is tenderness over the lower abdomen, usually so marked as to compel the patient to assume the dorsal decubitus, the knees being flexed on the abdomen so as to relax the abdominal muscles, and also to take off the weight of the bedclothes, which is intolerable. The pulse increases in frequency, often to 120, is small and wiry. The temperature will vary with the nature of the case. It may run up to 106° F. rapidly in simple inflammatory cases, or may be even subnormal in septic forms of the disorder, or may fluctuate irregularly between very high and very low, so that we must not depend implicitly upon the revelations of the thermometer, but be guided in our prognosis by a general consideration of the various symptoms. There is usually nausea or vomiting, more or less tympanitis, constipation of the bowels with much pain on defæcation, except in septic forms where diarrhœa is the rule, frequent micturition, with dysuria or vesical tenesmus.

The features become pinched and anxious, dark areolæ surrounding the eyes. Delirium is not infrequent.

Some cases from the first assume a chronic or latent form, the patients going about their usual occupations with merely a sense of local discomfort, increasing to pain at menstrual periods, accompanied by feverishness of an evening, difficulty in locomotion, and by a general sense of feebleness and malaise. The symptoms are frequently so insidious, and the progress of the disorder so masked, that beyond some slight bladder-irritation there is little or nothing to make us suspect the presence of the disorder, although post-mortem examination may reveal the presence of dense, firm adhesions over the whole of the pelvic roof, the organs being matted firmly together.

These cases are most likely to occur when some long-standing but not very severe source of irritation constitutes the exciting cause, such as endometritis, ovaritis, etc., but may also accompany gonorrhœal infection.

Amenorrhœa is a common result of peritonitis.

Physical Signs.—On examination, the hypogastrium will be found to be very tender on pressure. If much serum be effused, a sense of fluctuation may be detected on vaginal examination; the uterus is less mobile than natural, and gives rise to pain if any attempt be made it push it up; there is often a sense of resistance or tumefaction, like an ill-defined tumor, in the posterior *cul-de-sac* or to one side of the vagina, but there is none of the puffiness or œdematous condition met with in cellulitis. The tumor formed by the effused lymph and serum, and by the agglutination of the pelvic and abdominal viscera, is often extremely sensitive to touch; it may attain considerable magnitude, pushing the uterus forwards, rising above the fundus up to the pelvic brim, and even occasionally reaching as far as the umbilicus. Local collections of serum may occur between the folds of the intestines, having all the characteristics of cysts, or may be mistaken for abscesses. The adhesions formed over the pelvic roof are often very firm and hard, almost like a piece of board, fixing the pelvic viscera, and interfering considerably with the calibre of the rectum, or pressing upon the neck of the bladder.

Where suppuration takes place, the pus is often localized, so as to form a limited abscess, or a series of abscesses. They may be at some distance from the uterus, although the inflammation originated there.

Differentiation.—The conditions with which pelvic peritonitis will be most liable to be confounded are pelvic cellulitis, pelvic hæmatocele, and fecal impaction.

Cellulitis generally occurs after parturition, abortion, or some operation upon the uterus.

Peritonitis usually results from exposure to cold during menstruation, from extension of inflammation of the uterus, Fallopian tubes, ovaries, or pelvic cellular tissue, or escape of some irritating fluid into the peritoneum.

In cellulitis we have mostly a distinct rigor, followed by high temperature; these are less marked in peritonitis.

In cellulitis the pain is more of a bearing-down or dragging character, there being a sensation of fulness and pressure, vesica tenesmus, and throbbing or pulsation.

In peritonitis the pain is referred more to the hypogastrium, the recti muscles being kept rigid on pressure being attempted. The patient lies on her back with the knees drawn up, the features are pinched and anxious, and delirium or extreme mental anxiety are often present.

In cellulitis the swelling is frequently limited to one or other iliac fossa, seldom rises much above the pelvic brim, and generally suppurates.

In peritonitis the swelling is often more central, extends higher up in the abdomen, the abdominal walls being more movable over it than in the case of cellulitis.

In pelvic hæmatocele the sudden onset of the symptoms, evidence of internal hæmorrhage, absence of preceding inflammation

symptoms, bulk of the effusion, which is soft at first, becoming harder later on, and the concurrence of metrorrhagia, will generally serve to distinguish the one affection from the other, although the hæmatocele usually excites peritonitis, and so we have the two existing together.

Fæcal impaction may complicate either of the forms of pelvic inflammation and lead to the belief that the inflammatory process is still active, more especially where opium has been employed for long periods. Examination *per rectum*, and the removal of any accumulation, will soon clear up the diagnosis.

Other conditions have occasionally proved sources of error; they will be found mentioned under pelvic cellulitis.

Prognosis.—This will depend greatly upon the character of the attack. After parturition or abortion, if the attack be very severe, or the inflammation extend to the general sac of the peritoneum, the prognosis will of course be grave. The occurrence of a septic factor as a cause of its origin will also influence our opinion, recovery in these cases being often very tedious. Where the attack is insidious and chronic, the result of some pelvic disorder, provided it be not tuberculous or cancerous, or occurs after some operation in the non-puerperal state, the prognosis is more favorable.

Where the formation of abscesses occurs in place of adhesive inflammation, there is always the risk of perforation into the peritoneal cavity, or the lighting up of a fresh attack at the recurring menstrual periods, or from some accidental cause.

Course, Duration, and Termination.—This varies considerably. As with pleurisy we may have effusion, adhesion, and recovery, or formation of pus, empyema, or pneumothorax, and death ultimately from tuberculosis, so with pelvic peritonitis. It may run its course unobserved, only being detected *post-mortem*. It may come on very acutely, cause severe danger and discomfort, and yet the patient recover perfectly within a comparatively short time. In other cases the adhesions may be so dense that the pelvic organs are all matted together in one confused mass, effectually precluding impregnation, and rendering the patient a permanent invalid for the rest of her life.

Abscesses may form in different parts of the lymph deposit, each new centre of suppuration giving rise to a renewal of active symptoms.

General peritonitis may result from extension of the morbid process from the pelvic to the general surface of the peritoneum, or one of the purulent collections may burst into the peritoneal cavity and cause fatal peritonitis.

Results.—These are mainly amenorrhœa, dysmenorrhœa, and sterility, due to atrophy or abscess of the ovaries, compression or obliteration of the Fallopian tubes, and fixation of the uterus in some abnormal position, frequently that of retro-flexion or version, from the permanence of the adhesion or contraction of the exudation dragging the uterus to one or other side.

Treatment (Preventive).—Much may be done in this direction, far more than we might at first be willing to admit.

In those instances termed *autogenetic*, where the septic matter originates within the patient, so that she infects herself, a little extra attention on the part of the practitioner at the time of parturition, in those cases depending upon puerperal origin, may save much subsequent anxiety. Great care must be taken not to allow any portions of the membranes, or of the placenta, or any coagula, to remain *in utero*, and so give rise to putrefaction and septic absorption. The patients should be urged to sit up for a few moments at a time, to evacuate the contents of the bladder or rectum from the very first. This will allow any clots in the vagina or decomposing lochia to be expelled. The employment of the syringe daily by the nurse, with some antiseptic fluid, will also have the same effect.

The foetal head should never be allowed to remain for many consecutive hours arrested at the brim, or impacted in the pelvis, sloughing being apt to follow, and septicæmia as a natural result.

So-called *heterogenetic* causes, the septic matter being conveyed from without, account for many cases of pelvic peritonitis. No student during the time that he is dissecting or performing post-mortem examinations should ever be allowed to attend a patient in labor. As far as practicable the medical attendant upon parturient patients should avoid going direct to them from any infectious disorders in other patients, such as scarlet fever, erysipelas, diphtheria, or puerperal septicæmia itself. Where operative interference is requisite, the most scrupulous cleanliness of all instruments should be observed. Even the use of an imperfectly washed sponge, on which discharge has been allowed to remain and decompose by some careless nurse, may prove sufficient to induce septic mischief.

Strict personal cleanliness on the part of the practitioner should always be observed; even the presence of some decomposing discharge on the cuff of his coat, unobserved it may be at the time, may light up inflammatory mischief in the next parturient patient he attends. The fact of the practitioner being the subject of ozæna has before now been the cause of numberless fatal cases of puerperal septicæmia.

Treatment.—This is very similar to that of pelvic cellulitis in the early stage.

Absolute rest is the chief essential, and to ensure this the patient must be brought rapidly under the influence of opium. Large and frequently repeated doses will be requisite. Grain doses of pulv. or extract. opii, or quarter-grain doses of morphia, every two or three hours, depending upon the effect produced, may be given. In strong plethoric subjects, the application of leeches to the hypogastrium, followed by a large linseed-meal poultice, will often allay the pain very materially; but the same remarks apply to peritonitis as to cellulitis, both as to depletion and the use of mercury, and the reader is referred to these to avoid repetition.

The catheter may be employed to empty the bladder. The

action of the bowels should not be encouraged. Milk, beef-tea, jelly and simple nutritious diet, in small quantities frequently repeated, must be allowed. If vomiting be urgent, ice to suck, iced drinks, bismuth, pepsine, hydrocyanic acid, creasote, etc., may be tried, and where these fail a hypodermic injection of morphia and atropine will often succeed.

When the inflammatory process has somewhat subsided, counter-irritation to the abdomen by means of turpentine stupes, mustard poultices, painting with iodine, or, what is probably more efficacious, blistering fluid, may be resorted to.

In ill-defined chronic cases, or where the acute attack has subsided into the chronic stage, every means must be employed to improve the patient's health as much as possible. She must not be confined so rigorously to bed, but if weather permit should be allowed to recline on a sofa, well wrapped up, near an open window, or even permitted to drive out in a carriage if the pain be not thereby increased. The diet must be generous, alcohol in form of stout or ale, wines, and even spirits, being given if deemed requisite, but milk and animal broths will still form an important part of her diet.

If she can digest it, cod-liver oil will prove of service. Some form of tonic containing quinine or iron, or both, or mineral acids with bark, will also be indicated.

As to the evacuation of any collections of pus or serum, if the general health seems to suffer in consequence of their presence, the patient not progressing favorably, and there is evidence of pointing, or the collection can be easily reached, it may be well to employ the aspirator trocar, enlarging the opening subsequently if thought desirable, and washing out the cavity with some weak disinfectant lotion, such as one containing iodine, Condy's fluid, carbolic or sulphurous acid. But in all cases of peritonitic effusions or collections of pus, the greatest care must be taken lest adhesions be torn through, and the general cavity of the peritoneum opened.

Where the abscess points externally, antiseptic precautions should be taken in opening it, a drainage-tube being inserted, or the cavity washed out if necessary, as before indicated.

To encourage contraction of the cavity, the position of the patient must be attended to, so as to allow of the fluid gravitating towards the opening. Pads of cotton-wool, oakum, tow, or other similar material, may be also so arranged as to keep up pressure by means of a bandage, with a view to facilitate the same object.

Evacuation may be accomplished by means of the aspirator trocar, by a small trocar and canula, by a guarded bistoury, or other suitable cutting instrument.

Change of air to the seaside should be suggested as soon as the patient is able to bear the journey.

Great care will need to be taken in permitting patients to walk until all active symptoms have subsided, and even then the amount must be strictly regulated. Patients who are allowed to take exer-

cise commit all manner of indiscretions, overtaxing their powers by too prolonged fatigue, going out too thinly clad, or sitting about on damp grass.

For many months it will be necessary to carefully avoid all exposure to cold or fatigue, and to keep resting in the horizontal position, as far as possible, at the recurrence of each menstrual period.

Marital intercourse, without being strictly prohibited, must be restricted within safe limits; all emotional disturbances being particularly avoided at the above period.

Those who may be desirous of studying the subject more in detail will do well to consult the following works, which have been consulted by the author, and from which many important contributions have been extracted.

Barker, Fordyce, "The Puerperal Diseases."

Barnes, "Diseases of Women," 2d edition.

Duncan, Mathews, "Peri-metritis and Para-metritis."

Emmet, "Principles and Practice of Gynecology."

M'Clintock, "Diseases of Women."

Priestley, "Articles in Reynolds's System of Medicine," vol. v.

Thomas, "Diseases of Women," 5th edition.

CHAPTER XXIII.

PELVIC HÆMATOCELE.

Pelvic Hæmatocele.—Various terms have been employed to express an accidental effusion or collection of blood in the neighborhood of the uterus, either wholly or partially in the pelvis, whether in the peritoneal cavity or within the connective tissue of the pelvis, such as peri-uterine and retro-uterine hæmatocele, pelvic hæmatoma, pelvic thrombus, and pelvic hæmatocele. Of these pelvic

FIG. 127.



Retro-uterine Hæmatocele. (After BARNES.) A. The Hæmatocele filling the Cavity of the Sacrum, bounded above by Plastic Effusions and the Small Intestines. B. The Bladder. U. The Uterus pushed forwards. R. The Rectum.

hæmatocele, as proposed by M'Clintock, is probably the most correct as well as appropriate.

There are two distinct *varieties*, the sub-peritoneal and the intra-peritoneal.

The *intra-peritoneal* is by far the most serious kind. If the effusion proceed rapidly, death may result before coagulation takes place; if more slowly, violent inflammatory action is often set up. Some authors speak of this as being more frequent than the other. It is true Tuckwell found of forty-one cases examined *post-mortem* that thirty-eight were intra-peritoneal. Still this only proves that the cases were very severe; the extra-peritoneal form may still be much more common, though not so severe and not so fatal.

In *sub-peritoneal* hæmatocele the blood is effused into the cellular tissue surrounding the uterus, ovaries, and pelvic viscera generally.

Causes.—The *predisposing* causes are the *period of ovarian activity*, more especially the *period of greatest sexual vigor*, as between *twenty and thirty years of age*, particularly at the *menstrual epochs*, when there is *general hyperæmia of the sexual organs*; any *chronic uterine or ovarian disease*, especially if there be any *obstruction of the cervix uteri or vagina*; the *hæmorrhagic diathesis* or any diseased condition of the blood, such as met with in *zymotic diseases*, *lead-poisoning*, *jaundice*, *chlorosis*, *purpura*, *scurvy*; a *weak and varicose condition of the veins in the pelvis and lower extremities*.

The *exciting* causes are *sudden suppression of the catamenial flow from cold, mental shock, etc.*; *immoderate coitu*, especially at or near a menstrual period; *undue exertion, over-fatigue*, violent *straining at stool* or other muscular strain; any external violence, such as *falls, blows, etc.*; premature exertion after abortion.

Symptoms.—These vary somewhat, depending upon whether the effusion be *intra- or sub-peritoneal*.

In *intra-peritoneal* hæmatocele the onset is generally sudden, at or about a menstrual period. The symptoms are those of severe shock with intense abdominal pain, similar to those experienced in cases of perforation of the stomach or bowels, with extravasation of their contents into the peritoneal cavity. The suddenness and intensity of the attack not infrequently leads to a suspicion of poisoning. Marked *anæmia* rapidly ensues; *hiccup and vomiting* are often present. The *temperature at first is lower than normal*, and the surface of the body *pale and blanched*. The abdomen becomes tender and hard, as well as dull on percussion. Syncope, with small, rapid, and almost imperceptible pulse, or even complete collapse, rapidly ensues, and death not infrequently takes place within twelve hours from the commencement of the attack.

In cases less severe than this, where the attack occurs at a menstrual period, where this latter has not been checked by cold or other shock, the flow is often much increased and may continue so for many weeks, if the amount of effusion be not so great as to preclude further loss.

There is generally also a feeling of fulness, or weight, or bearing-down in the pelvic region, sometimes spoken of as a dull, heavy aching, at others as acute pain, producing violent efforts at expulsion as if some foreign body were present, uterine tenesmus so-called.

The action of the bladder and rectum are also interfered with.

In cases of *encysted hæmatocele*, the sub-peritoneal form, the hæmorrhage is often less profuse and less rapid, the onset of the attack is less marked, the symptoms being more insidious at the commencement, the prostration and shock less evident.

There is generally a feeling of weight or fulness about the anus, with frequent desire to evacuate the lower bowel, although no faecal matter, but only mucus tinged with blood, may be voided. There

is often partial or complete retention of urine, at the same time a frequent desire to micturate, though where the effusion is limited in extent, this symptom is less marked. Menorrhagia generally ensues and often persists for many weeks.

If the patient survive the first forty-eight hours or so, reaction generally sets in; the pulse becomes more rapid, the temperature elevated, there is a tendency to chilliness succeeded by a feeling of warmth and distention, with tenderness in the lower abdomen; the skin is hot. Retention of urine is not infrequent. The pain persists; menorrhagia continues. There is much rectal discomfort; often dysenteric diarrhœa with tenesmus and muco-sanguinous discharge, at other times much tympanitic distention with constipation.

Later on the febrile symptoms gradually subside, the pain decreases, the menorrhagia becomes less. For some considerable time, however, the patient experiences a feeling of weight and bearing down, difficulty in defæcation and micturition, pain or difficulty in walking, and much weakness.

Where the effused blood undergoes disintegration, the symptoms of irritative fever supervene. The countenance assumes a dirty, sallow, earthy hue; rigors, with vomiting, night sweats, elevation of temperature, and rapid pulse ensue. The abdomen becomes more distended, tympanitic and painful. The symptoms of septicæmia are marked, often accompanied by those of a low form of peritonitis.

Physical Signs.—These vary of course with the extent of the effusion. Within the first few days following the attack we shall usually be able to detect, on examining *per vaginam*, a more or less soft, smooth, tense mass, occupying the pelvis, blocking up the cavity, communicating to the finger on conjoined manipulation an obscure sense of fluctuation or elasticity. The uterus is generally pushed to one or other side, or more often upwards and forwards, the os uteri being detected high up behind the pubic symphysis, against which it is often firmly compressed, occasionally being flattened out into a narrow transverse chink, the cervix itself being obliterated by the effused blood, the fundus uteri often being detected just above and behind the pubes, if the hand be pressed carefully over the lower abdomen. The uterine sound may be employed if necessary. In some few instances the bulk of the effusion takes place between the posterior wall of the bladder and the uterus, pushing this latter organ back into the hollow of the sacrum; but these cases are comparatively rare. Exploration by the finger in the rectum should always be resorted to in any doubtful case, the bladder sound being passed into the bladder if requisite, to assist still further in the examination.

Where the effusion is great and takes place rapidly, there may be little or no displacement of the uterus, and even the mobility of this organ may not be seriously affected at first.

There will usually be detected in these cases a fulness or sense of resistance in the lower abdomen, more marked to one or other

iliac fossa possibly, or extending nearly up to the umbilicus, dull on percussion, tender to the touch. In some instances the effusion is so great as to fill up the pelvic cavity completely, pushing down the posterior vaginal wall almost to the perineum. This may be partly due to œdema of the recto-vaginal septum.

Later on the tumor *per vaginam* is felt to become more solid and tense, of unequal density, more irregular in outline, less resilient, and there is no longer a sense of fluctuation. This feeling of solidity depends upon coagulation having taken place, but more especially upon the formation of plastic effusion, the result of peritonitis, which serves to encapsule the mass. The serum becomes rapidly absorbed, the mass becoming by degrees more solid and diminishing in bulk.

In other instances the tumor becomes even more soft and fluctuating, increases in size; shivering, night sweats, anorexia, and elevation of temperature clearly indicating that suppuration is taking place.

Source of the Hæmorrhage.—This varies in different cases. It may be from

1. Rupture of one of the vessels in the uterine or ovarian plexus, as the pampiniform plexus, or the bulb of the ovary.
2. Apoplexy and rupture of the ovary.
3. Excessive hæmorrhage on rupture of a Graafian follicle, at the time of menstruation, into the peritoneal cavity.
4. Reflux of menstrual blood through the Fallopian tubes when the normal outlet at the os uteri or vagina is occluded.
5. Hæmorrhage from vessels of the peritoneum and other sources, such as false membranes, bursting of an aneurism, etc.
6. Constitutional causes, so-called cachectic hæmatoceles.
7. Rupture of the sac of an extra-uterine foetation in the early months. Rupture of the gravid uterus. Rupture of hæmorrhoidal veins.

Rupture of a cyst in the ovary or broad ligament.

Rupture of the distended Fallopian tube.

Dr. Barnes speaks of those cases of non-encysted, intra-peritoneal hæmatocele, depending upon rupture of the uterus, of tubal or other ectopic gestation cysts, of the ovary, of sub-ovarian vessels, or from a uterine varix or aneurism, when blood is rapidly poured out in large quantities into the peritoneal cavity, looking at the terrible suddenness and severity of the blow struck at the vital powers, as "cataclysmic." In these cases the shock and loss of blood alone may kill the patient without delay.

Differentiation.—The conditions most liable to be confounded with pelvic hæmatocele are:

1. Pelvic cellulitis, para-metritis, or pelvic abscess.
2. Retro-version or -flexion of the gravid uterus.
3. Ectopic or extra-uterine gestation.

Other conditions are said to complicate the question and must therefore be mentioned, but if ordinary care be exercised in listening to the history and in making a thorough examination, there

will be comparatively small risk of mistaking either of these conditions for hæmatocele. They are:

4. Fæcal accumulation.

5. Dermoid or other cystic tumors of the ovary or broad ligaments.

6. Uterine fibroids, retro-version or -flexion of the unimpregnated uterus.

7. Malignant tumors, enchondromatous or osseous growths from the walls of the pelvis.

1. In cases of *pelvic cellulitis*, *para-metritis*, or *pelvic abscess*, the constitutional symptoms present themselves in an inverse order from those of hæmatocele, febrile disturbance *preceding* the formation of tumor, whereas it *follows* in hæmatocele. The skin also does not become so rapidly pale as noticed in hæmatocele. Pelvic inflammation is more frequent than hæmatocele, and is more generally consecutive to abortion or delivery; hæmatocele is more constantly connected with some accidents of menstruation, and there is generally coincident metrorrhagia. The symptoms of pelvic inflammation are seldom developed with such sudden intensity as met with in hæmatocele. The swelling in the pelvis is more likely to begin laterally than posteriorly, is comparatively slow in formation, is hard and brawny at first, the fibrinous deposit being infiltrated through the pelvic tissues, fixing the uterus, often centrally, so that it cannot be elevated or depressed, instead of displacing it, as if soft plaster of Paris had been poured into the pelvis and hardened there.

Later on, if suppuration occurs, the deposit becomes soft and fluctuating. The deposit in hæmatocele is more often posteriorly, retro-uterine, rounded in form, and displaces the uterus from its natural position, generally forwards and upwards. The deposit is soft at first, and becomes harder later on if absorption takes place.

2. *Retroflexion* and *Retroversion* of the gravid uterus are not infrequently mistaken for hæmatocele, in that they may occur suddenly from accidents, straining, or any violent efforts, and lead sometimes to retention of urine and other urgent symptoms coincident with the formation of a retro-uterine tumor. Where the uterus is enlarged to between the third and fourth month of utero-gestation, and has become fixed or wedged in the pelvis, the diagnosis is often extremely difficult. The tumor is found to be circumscribed, sensitive, somewhat mobile, and in some cases can be lifted up above the pelvic brim by carefully directed pressure; it may, however, be fixed by old adhesions, and thus complicate the case considerably. There is also the history of early pregnancy to guide us. Even if the retroflexion has been suddenly produced, and retention of urine exist, there are none of the evidences of sudden or severe loss of blood.

3. In *extra-uterine gestation* there is usually amenorrhœa for at least a month or two, in place of menorrhagia; the mammæ show indications of pregnancy, the cervix and body of the uterus undergo alterations in bulk; the condition does not develop suddenly but

gradually, and there is an absence of urgent symptoms at the commencement. It should be remembered that the bursting of an early extra-uterine foetation—tubal gestation—is regarded by many as a frequent cause of pelvic hæmatocele. If, therefore, there be the least suspicion of extra-uterine pregnancy, the examination must be conducted with the greatest care.

4. *Fæcal accumulations* may mislead the unwary. An examination *per rectum* should never be neglected in any doubtful cases. The finger can be indented in the mass. The history of constipation will throw light upon the question.

5. Small *cystic tumors of the ovary* occasionally fall down into Douglas's pouch, and may even grow and become impacted in the pelvis, pushing the uterus over to one or other side, or they may contract adhesions, or become inflamed and suppurate, and thus cause much difficulty in diagnosis.

They may usually be distinguished by their lateral position, their mobility, slower growth, circumscribed form, and by their being elastic or fluctuating. There is also an absence of urgent symptoms from the commencement. The aspirator will often clear up the diagnosis.

Cases are not unknown of hæmorrhage taking place rapidly into the cavity of an ovarian cyst, and causing all the usual symptoms of hæmatocele.

Dermoid cysts are comparatively rare, and would probably not be suspected until an examination of the contents by means of the aspirator.

6. *Uterine fibroids* may generally be distinguished by their slow painless growth, their density, attachment to the uterus, with which they move, and by the irregularity of the surface.

Menorrhagia is a prominent symptom in these cases, as in hæmatocele, but there is an absence of any sudden supervention of symptoms.

Operations for the removal of supposed fibroids have before now been undertaken, when the case was one of retro-uterine hæmatocele. Where there is the least doubt, the exploring needle and aspirator had better be employed. The passage of the uterine sound will readily enable us to distinguish a retro-verted or -flexed unimpregnated uterus. If the sound pass backwards and downwards into the tumor posteriorly, and the fundus uteri cannot be detected behind the pubes, we may be pretty certain that we have not a hæmatocele to deal with.

7. *Malignant tumors*, mostly encephaloid in character, are rarely met with in the pelvis. The history of their gradual development, and the presence or absence of the cancerous cachexia, may possibly put us on our guard, though, as this latter closely resembles the peculiar pallor produced in hæmatocele, the difficulty of diagnosis is extreme. Enchondromatous and osseous growths from the bony pelvis occur very rarely; the history, their more or less stony hardness, the absence of pallor, etc., should guard us from mistaking them for hæmatocele.

Course, Duration, and Termination.—The effusion of blood in the intra-peritoneal form may be so great and so sudden as to destroy life within a very short time; such deplorable accidents are frequently associated with the rupture of an extra-uterine foetation cyst, as met with in tubal gestation. Where the hæmorrhage is less severe, and the patient does not die from shock or collapse, the effused blood may undergo gradual absorption, an indurated mass remaining for many consecutive months, gradually decreasing, and ultimately becoming entirely absorbed. In other cases the effused blood finds its way by perforation through the vaginal or rectal walls, bursting into one or other of these passages, and so becoming discharged. Secondary rupture into the peritoneal cavity, when the effused blood becomes disintegrated, is comparatively rare, more often it is evacuated *per rectum*. There is often a tendency to aggravation of the mischief at the catamenial periods; but it has also been noticed that a great stimulus to absorption occurs at these times, the swelling disappearing as it were by successive stages. Perfect recovery may ensue after the lapse of several weeks or months, depending upon the amount of effusion, subsequent amount of peritonitis, occurrence of septicæmia, and other conditions.

Prognosis.—This will depend a great deal upon the amount of blood effused at first, degree of constitutional shock resulting, and the intensity of reaction excited.

Where expectancy is intelligently carried out, surgical interference not being rashly resorted to unless clearly indicated, the prognosis is generally favorable. Death may occur either from the extreme amount of blood suddenly withdrawn from the general circulation, shock or collapse, peritonitis, septicæmia, or rupture of the encapsulated mass into the peritoneal cavity.

The larger the amount of blood effused the greater will be the risk of septicæmia resulting, or of a low form of peritonitis being set up from disintegration of the mass. Exhaustion often follows the process of suppuration, which occurs when the blood is discharged by opening into the rectum or vagina, especially if this opening be valvular or of limited extent.

Treatment (Prophylactic or Preventive).—All cases of obstructive dysmenorrhœa in which hæmatocele is likely to occur should, whenever practicable, be dealt with surgically, and every precaution taken in the way of avoiding unnecessary fatigue, dancing, exposure to cold, long journeys, etc., just at the menstrual period. Sexual intercourse near these times should be prohibited, and strict moderation observed at all times.

Patients who suffer from varicose veins of the lower extremities, vulva or rectum, and who menstruate very profusely as well as painfully, should especially avoid all the exciting causes known to produce hæmatocele (Priestley).

Where abortion in the early months has occurred, the patient should be kept in the recumbent position for several days afterwards, and all unnecessary excitement or fatigue avoided.

Where hæmatocele, however slight, has once occurred, the patient will need to take every precaution at succeeding menstrual periods not to incur any known risks of exciting a recurrence of the attack.

Therapeutic Management.—If called in early, our first efforts will naturally be directed to checking the further effusion of blood, promoting coagulation, averting the tendency to death from shock or collapse, and allaying pain.

The patient, if not already in bed, should at once be placed there, and the clothes removed with as little disturbance as possible. She must be kept absolutely quiet on her back. A hypodermic injection of morphia will have the effect of allaying pain and lessening the amount of shock, as well as rendering her less restless.

If great prostration or collapse ensue, it may be necessary to resort to alcoholic stimulants, such as iced brandy and water, iced champagne, etc., but opium is a far safer restorative in these cases. Locally, a bladder of pounded ice may be placed over the lower abdomen, or iced water injected *per rectum* if deemed advisable.

In patients whose abdominal walls are thin and lax, it is a question whether the better plan is not to cover the abdomen with thick pads of cotton-wool or folded napkins, and exercise as much compression as deemed prudent by means of a broad bandage, extending from the hips to the ensiform cartilage, which will materially lessen the capacity of the abdomen, and so exercise pressure upon the bleeding vessels.

Under no circumstances should hot fomentations or poultices be employed with a view to relieve the abdominal pain; they would but tend to encourage the extravasation, and thus defeat our main object.

If extra-uterine gestation be known or suspected to have been present, and rupture of the cyst is the presumable cause of the hæmorrhage, if this latter be very severe, as evidenced by the effect produced upon the system, it is quite an open question whether we are not perfectly justified in making an exploratory incision in the abdomen and endeavoring to secure the bleeding vessels by ligature or otherwise. Nay, more, is not the performance of gastrotomy imperatively demanded where we have every reason to believe that, in these days of antiseptic abdominal surgery, the operation might be done with safety and success?

Few practitioners will probably be inclined to follow the French custom of bleeding from the arm, or the application of twenty leeches to the abdomen, with a view to arresting the internal hæmorrhage.

During the first few days the diet must be simple, unstimulating, and restricted in quantity, sufficient only being taken to prevent exhaustion. As little alcohol as possible should be given. The patient should be kept slightly under the influence of opium; the catheter had better be passed about every eight hours. No attempt at relieving the bowels should be resorted to; if much discomfort

be present, opium should be administered *per rectum*. The efficacy of astringents and hæmostatics in arresting the hæmorrhage is very problematical; sulphuric or gallic acid may be tried if thought desirable, or ergot may be given by the mouth or subcutaneously.

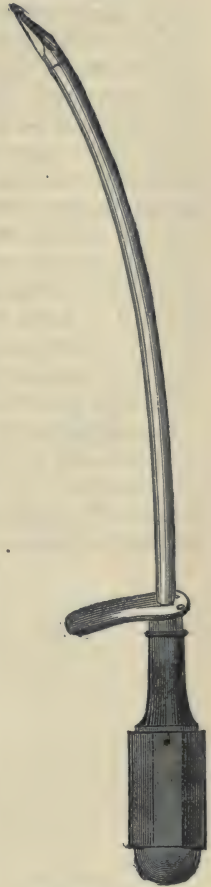
After the alarming symptoms of the first stage or shock have subsided, a certain amount of feverish reaction generally sets in; the symptoms of peritonitis become marked. Salines, quinine, and opium may be administered internally, and a few leeches applied to the abdomen. Any warm poultices or fomentations must be used with great care, lest a fresh access of hæmorrhage takes place. Perfect rest must be enjoined, so as to favor adhesions taking place, and the effused blood becoming encapsuled.

Surgical Treatment.—This has given rise to endless controversy, opinions varying very considerably as to the expediency of puncturing the tumor after the more acute symptoms have passed. "So long as the local distress is not urgent, so long as the tumor remains hard, so long as there is no sign of septicæmia or irritative fever, so long is it wise to follow the expectant method, observing strict rest, and abstaining from all local interference. But when the tumor softens, when it enlarges immoderately, when the pulse and temperature rising indicate septicæmia, then it is time to consider the resort to puncture" (Barnes). The usual site for puncture is the upper portion of the posterior cul-de-sac of the vagina, where there is generally marked bulging. In some cases the bulging is more prominent in the rectum, and then it may be deemed prudent to puncture *per rectum*, though this site should be avoided if possible, as "the irritating and exhausting diarrhœa produced by evacuation into the rectum frequently adds a new source of danger to a patient already much enfeebled by the previous progress of the affection" (Priestley).

When the swelling is not readily accessible by the vagina, but reaches high up into the abdomen and there is obvious pointing externally, it may be safer to puncture through the abdominal walls.

An ordinary bladder trocar (Fig. 128) may be employed if the effusion be broken down and sufficiently liquid to pass through the canula. The left forefinger being inserted *per vaginam* and passed up to the most bulging point, the trocar is guided by the right hand along the finger and plunged in the direction of the axis of the pelvic brim, parallel with the posterior wall of the uterus. The

FIG. 128.



Bladder Trocar.

trocar must be pushed deeply into the sac, so as to penetrate the laminated coagula forming the outer boundaries, which are often of considerable thickness. The canula may be left *in situ* for the fluid to drain off, or a drainage-tube inserted.

If the blood be chiefly coagulated and not fluid, it will probably be necessary to enlarge the opening by means of a bistoury or tenotomy knife, or, better still, by the galvanic or Paquelin's cautery knife, and clear out the clots by the aid of the finger or scoop; but it will be better not to attempt too much. Where decomposition of the contents of the sac arises, the cavity must be washed out twice daily with some disinfecting fluid, such as Condy's fluid, carbolic acid, iodine, etc.

If there be signs of fresh suppuration after the use of the trocar, with renewed distention of the cyst, the laying open by larger incision will be almost inevitable.

In these cases where no surgical interference is resorted to, the patient should be carefully watched for many consecutive months. Absolute rest at the catamenial periods should be enjoined, and even in the intervals the amount of exertion should be carefully regulated; no undue fatigue, long walks, or sexual excitement should be permitted. The bowels must be regulated, the diet restricted to light and easily digestible articles. Tonics, such as the syrups of the iodide or bromide of iron, citrate of iron and quinine, bark and acid, with nux vomica, or other appropriate mixture, should be prescribed.

Locally, the application of blisters, painting with iodine, or the employment of mercurial and belladonna ointments, may prove serviceable.

Change of air, and everything likely to restore the patient to her former state of health, should not be forgotten.

CHAPTER XXIV.

DISEASES OF THE FALLOPIAN TUBES, INCLUDING EXTRA-UTERINE
GESTATION.

Diseases of the Fallopian Tubes.—*Salpingitis*, or *inflammation of the Fallopian tubes*, is generally the result of extension of inflammation from the lining membrane of the uterus. The acute form ending in suppuration is mostly observed as a sequel of septic endometritis, or as an extension of gonorrhœa. The pus accumulating in the tube and not escaping readily by either end forms a tortuous dilatation of the middle portion of the tube. Sudden and rapidly fatal peritonitis may result from extension of the inflammatory process through the fimbriated extremity, from escape of pus through the same orifice, or from pus being poured into the peritoneal cavity through a perforation the result of ulceration or rupture from undue distention.

Obstruction or obliteration of the Fallopian tube may occur at any portion of it, in consequence of pelvic peritonitis and the formation of bands of adhesion which constrict the tube, or if the latter become twisted or bent it may be bound down by lymph, which in process of contraction effectually closes the tube. In other cases the fimbriated extremity of the tube becomes matted together by lymph. In some instances a small polypoid growth may interfere with the patency of the uterine orifice of the tube, or the pressure of an interstitial fibroid may have a similar effect.

The result of obliteration of the tubes, where both are affected, is sterility. Hæmatocele may be caused by effusion of blood into the peritoneal cavity, when rupture of the Graafian follicle occurs in the surface of the ovary, the ovum not being conducted into the tube.

Where the obstruction to the tube is only partial, the impregnated ovum may become arrested and give rise to the most frequent form of extra-uterine gestation, viz., tubal fœtation. Rupture of the tube generally occurs at a later stage, and death from hæmorrhage is not infrequent.

Dilatation of the Fallopian tube may result from obstruction in some portion of the uterine cavity, as at the internal os, in cases of pronounced flexion. The menstrual blood being unable to gain exit by the normal outlet, the cavity of the uterus becomes distended, reflex action is excited, uterine colic or expulsive pains are produced, and retrograde dilatation of the uterine ends of the tubes ensues. It is in these cases that the uterine sound occasionally passes several inches beyond the normal distance, though there is little doubt but that in some instances the point of the

sound perforates the softened muscular tissue of the uterus, more especially within a few weeks after parturition, when the uterus is in a condition of subinvolution.

As it not infrequently happens that in the class of cases likely to produce dilatation of the tubes we may have to resort to the injection of astringent or styptic fluids into the cavity of the uterus, to restrain hæmorrhage or to check profuse uterine leucorrhœa, too much care cannot be exercised in avoiding any undue force and in providing for the return of the fluid.

Uterine contractions being excited, the fluid may readily be driven along the tubes, and thus cause severe symptoms from shock or collapse, or set up peritonitis, which may prove fatal.

There is also danger of the menstrual secretion finding its way into the peritoneal cavity, constituting peri-uterine hæmatocele, or of any collections of mucus or pus being driven backwards and setting up peritonitis.

In cases of atresia or closure of the uterus, vagina, or vulva, leading to retention of the menstrual fluid, the Fallopian tubes often become considerably distended, and may either burst or become perforated, and so allow blood to become extravasated into the peritoneal cavity. In *puellæ publicæ*, where the fimbriated extremity of the tube becomes closed in consequence of extension of gonorrhœa, or of those attacks of metritis or peritonitis to which they are so subject, symptoms known as *colica scortorum* are not infrequent.

Hydro-salpinx, or dropsy of the tube, occurs in those cases where stricture or obliteration of the extremities of the tube takes place. The secretion gradually accumulating and being unable to discharge itself into the uterus as usual, saccular dilatation of the tube results, the collection in some instances attaining the size of the fœtal head, or even larger. The distended tube usually assumes a convoluted form, the outer extremity presenting the maximum of distention. The fluid contents vary from a yellowish limpid serum, containing large quantities of albumen, to a thick muco-purulent or sanguineous fluid. In many instances both tubes are similarly affected.

Diagnosis.—Dropsy of the tube may sometimes be distinguished from a small ovarian cyst, with which it is most liable to be confounded, by the following points:

In the case of distention of the tube, the swelling is generally convoluted, elongated, and cylindrical. Its position is more anterior than that of an ovarian cyst, and can often be felt behind Poupart's ligament by conjoined manipulation. Affections of the tubes, excluding tubal gestation, are frequently symmetrical, when the uterus is detected in a central position. Where one tube only is affected it pushes the fundus towards the opposite side, thus causing obliquity of the uterus. Examination of the fluid when drawn off by the aspirator would also assist the diagnosis.

A small ovarian tumor generally falls behind and a little to one side of the uterus, pushing this latter forwards against the sym-

physis, often causing pressure upon the bladder and even retention of urine. It is usually spherical in shape, and can be detected readily on examining *per rectum*.

Treatment.—Puncture *per vaginam*, with an aspirator or small trocar, and examination of the fluid, will generally enable us to distinguish between dropsy of the tube, cyst of the broad ligament, ovarian cyst, and an extra-uterine gestation cyst. As Barnes puts it, absolute precision of differential diagnosis is not imperative, as the same indication to puncture the cyst exists in all these cases. In the first two the cyst is not likely to refill, whereas, if it be ovarian, the fluid will in all probability collect again within a very short time.

Fallopian catheterization, by means of a fine whalebone probe, has been suggested as a method of evacuating the retained fluid and keeping the uterine ends of the tubes patulous.

Hæmato-salpinx, or distention of the Fallopian tube with blood, not infrequently complicates hæmatometra from occlusion of some portion of the genital canal, as mentioned under dilatation of the tubes.

Fibroid tumors or myomas similar to those found in the uterus may occur in the Fallopian tubes.

Tubercle and cancer have also been observed, but as these affections are comparatively very rare, and but little can be done in the way of treatment, we need not stop to consider them further.

Ectopic or Extra-uterine Gestation.

Although this subject belongs strictly speaking to obstetrics, and is rarely more than even alluded to in works on gynecology, it will be of advantage to the student if we consider the question in the present treatise, as a knowledge of it is essential in forming an opinion in all cases of doubtful or obscure pelvic and abdominal tumors. It will be needless to enter into the various perplexing varieties that the zeal of modern obstetricians has elaborated.

The classification of the late Dr. John S. Parry, of Philadelphia, who recently published a most exhaustive monograph upon extra-uterine pregnancy, will be found to include every possible variety. It is from his graphic description that the following account is mainly condensed:

<i>Species.</i>	<i>Varieties.</i>
Tubal Pregnancy.	<i>Tubo-ovarian</i> (the germ being arrested in the pavilion, which contracts adhesions with the ovary).
	<i>Tubo-abdominal</i> (germ arrested in the same locality. The tube may contract adhesions with neighboring organs. If it does not, the chorion may project into the abdominal cavity, with a part of its surface bare).
	<i>Tubal proper</i> (germ arrested between the pavilion and that portion of the oviduct which traverses the uterine wall).
	<i>Tubo-uterine</i> (germ arrested in that portion of the tube which passes through the uterus).

<i>Species.</i>	<i>Varieties..</i>
Ovarian	{ <i>Ovarian proper</i> (germ contained in the ovary, that organ remaining free from adhesions). <i>Ovario-tubal</i> (germ contained in the ovary, which contracts adhesions with the pavilion of the tube).
Pregnancy.	
Ventral or Abdominal	{ <i>Primary</i> (ovum developed from the outset in the peritoneal cavity). <i>Secondary</i> (development commences in the tube or ovary, the cyst ruptures, ovum escapes, and continues to live and develop in the peritoneal cavity).
Pregnancy.	

For our present purpose it will be sufficient to consider the three species: *tubal*, *ovarian*, and *ventral*. Of 500 cases, collected by Dr. Parry, 214 were tubal, 27 ovarian, 29 abdominal, 230 being doubtful; but even here there are some manifest sources of fallacy, and as the author himself remarks, "the above statement is of little value."

The ovum may be arrested and go on developing in any portion of the oviduct, constituting *tubal pregnancy*. The weight of authority is in favor of the possibility of *ovarian pregnancy*.

Facts, while they do not prove that fecundation can occur in the peritoneal cavity, make it extremely probable that it does sometimes happen; this constitutes *abdominal pregnancy*.

Causes.—Pelvic inflammations, peri- and para-metritis, frequently cause extra-uterine pregnancy by producing constriction and displacement of the uterine appendages. Erratic pregnancy is apt to occur in women who have become pregnant after having manifested an inaptitude for conception, either primarily, or after they have borne one or more children—frequently after a long pause in conception.

Hernia of some portion of the internal genital organs may sometimes cause extra-uterine gestation. It seems not improbable that some of the ordinary uterine displacements may occasionally produce extra-uterine conception by preventing the migration of the ovum along the Fallopian tubes.

Tumors of the uterus and surrounding organs sometimes produce this accident by obstructing the Fallopian tubes. An unhealed section of the uterus, made in the operation of gastro-hysterotomy, has caused extra-uterine gestation.

Moral and mental influences may cause this accident, such as strong emotions, occurring during or shortly after intercourse, especially in widows and young girls who indulge in illicit hymeneal pleasures, as the fear of discovery or fright experienced during or immediately after the sexual act; but it is to be remembered that this terrible accident is much more frequently due to pathological changes in the internal sexual apparatus, than it is to emotional disturbances experienced at or near the time of coitus.

Any injuries, such as blows, shocks, falls, or severe exertion during the first few days after conception, may alter the relation of the tubes, ovaries, and uterus in such a manner as to prevent the descent of the ovum.

In cases of combined intra- and extra-uterine pregnancy the two

ova may obstruct each other in their descent to the uterus, and thus cause the accident.

Various diseases of the Fallopian tubes may impede the descent of the ovum, or even temporary flexion may sometimes obstruct the oviduct, and thus lead to the arrest of the germ. Deranged physiological action, such as spasm of the muscular coat of the tubes, due it may be to the violence of the voluptuous sensation during coitus; paralysis, too great relaxation and inaction of the muscular fibres of the canal, have likewise been supposed to cause it. Ovules produced in Graafian vesicles developed on the margins of the ovary, and especially upon its posterior, inferior portion, will be less likely to reach the tube safely than those liberated from the upper portion and near the centre of the ovary.

Long-continued functional activity of the genital organs, and the diseases produced thereby, are not without influence on the production of extra-uterine pregnancy; hence the accident is more frequent in multiparæ than in primiparæ.

Pathological Anatomy.—The *uterus* after death from rupture in the early stages is found to be more or less enlarged. It always undergoes, to a greater or less extent, those changes which prepare it for the reception of the ovum. The organ is more vascular than natural, and its cavity is often found to be lined with a decidua.

This is absent only when it has been discharged before the death of the patient, being rarely retained until the completion of gestation, and thrown off during false labor. More frequently, if the patient goes to term, it is discharged during the early periods of pregnancy in small fragments, and without producing pain; or else it is expelled *en masse* with symptoms of miscarriage.

The cervix is filled with a plug of thick gelatinous mucus, precisely as it is in normal gestation.

The uterus, although prevented from discharging its functions, prepares to do its work precisely as if the fertilized germ had entered its cavity.

The *corpus luteum* is present as a rule, its absence is the exception, especially in the early months of gestation. It is a curious fact that it has been found in the ovary which is on the side opposite to that occupied by the gravid cyst.

If the gestation is ventral, whether primary or secondary, the sac is composed of the ovular envelopes of the fœtus alone, or conjoined with an adventitious membrane, formed as the result of irritation and inflammation. In a few instances of secondary abdominal gestation, the child has been found in the abdomen, uncovered by any membranes, or surrounded only by an adventitious cyst. Upon opening the fœtal cyst the *liquor amnii* will be found to present its normal characters. The *umbilical cord* is almost always normal in its formation. The *placenta* varies considerably in different cases. It may be attached to any portion of the surface of the peritoneum, within the ruptured fœtal cyst whether it is ovarian or tubal, or lastly within the uterus itself.

In women who die at term, the womb is more or less displaced.

It is generally elevated, the cervix being carried towards and above the pubes. At the same time it is pushed to one side, though it is sometimes found in the middle line. Though the fœtus is generally developed behind the uterus, it may lodge anterior to the organ, which is consequently pushed backwards and downwards. In rare cases even the bladder is found behind the vicarious uterus.

The womb is enlarged in almost all instances. Very rarely, indeed, does it fail to undergo some nutritive change, but at term the organ is not often found larger than that of the fourth or fifth month of pregnancy, and at this time it rarely contains a decidua; this has usually been thrown off before death occurs.

The autopsy of women who have lived some time after the death of the child may reveal characters very different from those described. The fœtus now either undergoes decomposition, or the cyst shrinks, the liquor amnii being reabsorbed, and the product of conception lies quiescent in the abdomen. In the former case the cyst walls will be found inflamed, and they may be partially or wholly destroyed.

They may become attached to the surrounding organs, the bladder, vagina, intestinal canal, or to the abdominal wall, by either or by all of which channels the cyst may be found discharging its decomposing contents. The fœtus may be found but little altered, or most of the soft parts and small bones may have disappeared before the autopsy is made.

In the second case, in which the child remains a foreign body—but innocuous—the cyst wall may undergo either a cartilaginous or a calcareous degeneration.

Under the same circumstances the fœtus may become the seat of the deposit of calcareous salts—ossified, the older writers termed it. It is then converted into a lithopædion. In other rare cases it is converted into a matter like adipocere. In some cases the child simply dries up, and becomes indurated and mummified, from absorption of its fluids, while in others it may remain almost unchanged year after year.

Symptoms.—These vary with the different stages of the gestation, and may be conveniently studied under three divisions.

1. During the first months of pregnancy, when the fœtal heart is still inaudible.

2. After the period when the fœtal heart can be heard, and until after the close of spurious labor at term.

3. After the termination of false labor, or the death of the fœtus.

First Period.—The patient in the first instance supposes herself to be pregnant, and during the first month or two nothing particular occurs to warn her of her anomalous condition. The early symptoms of gestation appear; when suddenly, and without any warning, the unfortunate victim of this terrible accident is seized with a violent pain in the abdomen, generally described as colic, and referred to one or other hypogastric region. It is extremely violent, preventing the patient from standing erect, or lying stretched out in bed.

It produces considerable and even profound prostration. The surface may become pale and cool, the skin covered with a cold, clammy perspiration, and the pulse small and threadlike. There may be vomiting, and the suffering may be so great as to cause syncope.

The pain gradually disappears, and the patient seems to recover, when she is again attacked with a fresh accession of pain of the same terrible severity. These paroxysms are renewed with more or less regularity at intervals varying from a few days to two or three weeks.

These pains rarely set in earlier than the end of the first month after conception, and their accession is sometimes postponed until the fourth or fifth month, though not often.

If rupture does not occur, the attacks of colicky pains may disappear some time after the fifth month of gestation, may recur towards the end of pregnancy, or may continue nearly or quite to the end of gestation. The paroxysms may come on without assignable cause, or may depend upon coitus, defæcation, etc.

It appears probable that they are produced by contractions of the fœtal cyst, and are not due to peritonitis, as frequently supposed. The pressure of the fœtal cyst upon the contiguous structures may also partly explain them. Hæmorrhage from the vagina is an important phenomenon of this early stage. The flow loses its periodicity entirely, occurring at uncertain and irregular intervals, like the colicky pains. It sometimes consists of dark-colored coagulated blood, attended with the discharge of the decidua *en masse* or in very small pieces. If metrorrhagia does not set in earlier, it is very likely indeed to make its appearance immediately before rupture of the cyst takes place. This hæmorrhage is due to general congestion of the internal generative organs, to the separation of the ovum from the cyst walls, or to that of the decidua which lines the uterus. The expulsion of the decidua in one mass, during the early stages of the gestation, is attended with expulsive pains and all the other symptoms of abortion. The patient is often supposed to have miscarried, or to have expelled a mole or blighted ovum, and only a careful examination of what has been passed will enable the physician to determine the question, and keep him from falling into errors that might have been easily avoided.

Physical Signs.—Not until violent pains, or hæmorrhage, or both combined, have directed attention to the fact that there is something abnormal about the woman's condition, will a vaginal examination be demanded. The uterus will then be found to be enlarged, though not equal to that of a uterine pregnancy of the same duration, except in the very early stages. It will usually be found to be deviated from the normal position by the presence of a tumor on one side, behind, or even in front of the organ.

The tumor is generally elastic, fluctuates, and by *ballotement* shows that it contains a solid body floating in liquid. It may be more or less firmly fixed, or may enjoy considerable mobility. If

the tenderness be so great as to preclude a satisfactory examination of the pelvis, ether may be administered, though the danger of retching afterwards is an objection to its employment. Rapid dilatation of the urethra, so as to allow the finger to be introduced into the bladder, has been proposed as an additional method of investigation, to aid us in detecting the peri-uterine tumor, the finger of the other hand being passed into the vagina or the rectum.

Second Period.—The symptoms at this stage are more marked. The ordinary signs of pregnancy continue. The colicky pains may persist or entirely disappear. After the fourth month their severity is generally materially diminished, if they do not cease to occur. The foetal heart is audible. The foetal movements are often well marked, and sometimes extremely painful, appearing more vigorous to the patient than in normal gestation. A term is approached, at or near the time of spurious labor, when the child perishes. This is not infrequently attended with symptoms which attract the attention of the mother, such as violent, disorderly, and even painful movements on the part of the child, after which they cease entirely. The foetus is often spoken of as giving a violent struggle at this time, though the symptom is by no means constant in its occurrence.

The metrorrhagic discharge may continue during this stage, or it may not. If the decidua has been thrown off during the early months of pregnancy, metrorrhagia is exceedingly apt to be absent during this stage.

The breasts undergo the usual changes; they become fuller, milk is secreted, the areolæ darken, and the follicles enlarge.

Examination of the Abdomen.—Upon *inspection*, the enlargement is generally found to be mainly upon one side, the transverse being greater than the longitudinal diameter. The head or breach may be detected projecting out, or foetal movements may be visible.

The abdominal brown line may or may not be developed. Upon *palpation* the foetus may be felt to be very superficially situated in the abdomen, as if the skin only was between the hand and the child.

As pregnancy advances the fundus uteri can frequently be made out, by careful palpation, as a hard, pear-shaped body on the anterior surface of the gravid sac. It may even form a projection which is visible on inspection.

Auscultation reveals the same sounds that are heard in normal pregnancies. They are sometimes remarkable for their intensity.

Physical Signs.—Upon vaginal examination the uterus will be found to be enlarged, but not in proportion to the duration of the pregnancy. The neck will be found more or less softened, enlarged, and otherwise altered, as after normal conceptions, but not to so marked a degree.

The uterus is generally found to be displaced, pushed to either side, or forwards and upwards, elevated above the pubes, so that it can only be reached with the greatest difficulty. A tumor will be felt generally situated behind the uterus, and in the latter stages

may completely fill the pelvis. Portions of the fœtus may be felt through the vaginal walls. Œdema of one or both lower extremities occasionally, though not very frequently, results from pressure on the larger venous trunks of the pelvis and abdomen. The bladder may be so pressed upon by the tumor as to render the discharge of urine difficult and painful, or arrest the flow entirely. The rectum may be so narrowed as to lead to obstinate constipation or complete obstruction.

Labor at Term.—Where extra-uterine pregnancy is prolonged until the end of the normal period of gestation, it is the rule for the woman to have pains identical in all particulars with those of labor at the end of normal pregnancy. In rare cases, spurious labor does not occur at the end of gestation. The pains have the natural intermittent periodical character, so that the patient and medical attendant as well are not undeceived until a vaginal examination is made by the latter.

In some instances the pains come on prematurely, as in normal pregnancy, but it is rare for "delayed labor" to occur. The duration of the spurious labor varies considerably, from a few hours to two or three weeks.

The severity varies much in different persons. Sometimes they are fugitive and comparatively trivial, so that it is difficult to recognize their true nature, while at other times they are of the most severe type, and tax the patient's powers of endurance to the last degree.

In certain cases, though not very frequently, this spurious labor is repeated at intervals of variable duration, often at periods corresponding to the usual term of pregnancy for several consecutive years.

This unavailing labor is usually, though not invariably, attended with a hæmorrhagic discharge from the vagina, followed in many instances by a vaginal discharge which resembles more or less closely the lochia.

In connection with labor at the close of extra-uterine pregnancy, it is important to remember that it rarely ends in rupture of the fœtal cyst, so that neither our prognosis nor treatment need be influenced by its possibility as regards the mother. As to the child, having now reached the full period of its development, and the placenta undergoing those changes which prepare it for separation, death probably ensues, though in the opinion of a number of competent observers, the life of the fœtus may be maintained for some time after the termination of the usual period of gestation.

An extra-uterine child may be retained for an indefinite time. Though the presence of an encysted fœtus is not incompatible with life, and even with comfort and usefulness, the woman who bears such a burden with her is in constant danger of the cyst taking on inflammatory action, which will greatly endanger, and may even destroy her life. After this, the product of conception may become desiccated or mummified, or it may be converted into a substance resembling adipocere, or into a calcareous mass. Again, the cyst

may open through the abdominal wall, bladder, vagina, or bowels, the *débris* of the child being discharged. During this time the patient is liable to become exhausted, symptoms of pyæmia or septicæmia setting in.

Symptoms of Rupture of the Cyst.—Not more than half the women afflicted with extra-uterine gestation carry the child to term; the large majority of the other half are the victims of rupture of the cyst.

After various attacks of colicky pain, she suddenly experiences pain in one iliac fossa, usually associated with metrorrhagia. At the moment of rupture she feels as if something had given way or been torn inside her. She then becomes very weak, the skin is cool and pale, often covered with a clammy, cold sweat; her pulse is almost obliterated. Fainting occurs, the syncope is often of the most terrible character, the depression profound; convulsions and delirium may supervene, or the intellect may remain perfectly clear. The patient has all the symptoms of violent shock, succeeded by those of hæmorrhage, for which the slight loss of blood by the vagina is by no means sufficient to account. The abdominal pain is very severe. If metrorrhagia has not preceded the symptoms of rupture, it quickly follows them in almost all instances.

The fainting is due at first to the shock, and may be repeated, but the occurrence of fainting during the progress of extra-uterine pregnancy does not indicate internal hæmorrhage with any certainty. It may attend the attacks of colicky pain which are so characteristic of this condition.

Physical Signs.—On examining *per vaginam*, the accumulation of blood in the pelvic cavity may give rise to a sense of fulness, which can be felt behind the uterus, but no distinct tumor will be found unless the patient lives long enough for the peritoneum to become inflamed and for the effusion to become encysted, when all the signs of pelvic hæmatocele will disclose themselves, or unless the cyst occupy Douglas's pouch as indicated previously.

The patient may die within a few hours from shock or hæmorrhage, or both combined. This, however, is not the usual result. Reaction sets in after some hours; the abdomen may enlarge, become tender and tympanitic, symptoms of acute peritonitis rapidly supervening, the pulse increasing in frequency, the temperature becoming elevated; but this is not the rule.

Peritonitis is a rare sequel of rupture of the cyst, and even when pain, tenderness, and other symptoms of this affection supervene after the escape of the ovum, they do not necessarily indicate the existence of inflammation.

Peritonitis so rarely follows rupture of an extra-uterine gravid cyst, that the possibility of its occurrence need not be taken into consideration in the decision of any questions relating either to prognosis or to treatment.

Twin conception in extra-uterine gestation is much more frequent than in normal gestations, though both children are rarely developed in the same locality.

Pregnancy may occur while carrying an extra-uterine fœtus, labor being perfectly easy and natural, though the tumor resulting from the misplaced conception may produce very distressing mechanical effects during a subsequent normal gestation.

Repeated extra-uterine pregnancy has been known to occur without materially increasing the danger.

Pregnancy in a Hernial Sac, inguinal for the most part, may occur, though it is possible in the crural or even umbilical regions. The tumor may be both painful and sensitive, but the paroxysmal attacks of abdominal pain and colic, which have been spoken of as so characteristic of misplaced pregnancies in organs which are not intended to undergo any amount of distention, are absent. The patient is inconvenienced chiefly by the locality and size of the tumor, which may even reach to the knees. The fœtus itself can be felt in the mass, as also its movements, while the sound of the child's heart and the placental murmur can be heard on auscultating it.

Terminations and Mortality.—*Rupture of the cyst* generally occurs before the end of the fourth month. The patient may still go to full term if the placenta remain undisturbed. There may or may not be peritonitis, leading to secondary encystment of the fœtus. The rule is that these melancholy cases end in death.

Changes which follow Retention of the Fœtus for a long period.—Where the sac has not ruptured at the end of the nine months, the liquor amnii ceases to be secreted and becomes reabsorbed.

The cyst walls contract, the infant becomes compressed and converted into a hard, mummified mass, or from calcareous deposition becomes ossified or petrified and converted into a lithopædion, or becomes converted into a friable, fatty substance like adipocere.

Discharge of the child through the bowel, bladder, vagina, or abdominal wall.—If the cyst does not become quiescent, it inflames and suppuration occurs; peritonitis is set up which produces adhesions between the cyst and the adjoining organs, including the anterior abdominal wall; the cyst then opens, and air being thus admitted into the cavity of the cyst, decomposition of its contents goes on rapidly until the soft parts are destroyed. The rectum or sigmoid flexure is generally the site where the cyst opens into the bowel; about the umbilicus, and in the middle line just below it, when through the abdominal wall. The most frequent position is the intestinal canal, next through the abdominal wall, and then through the vagina and bladder respectively; the danger increasing in ratio with the rarity of the mode of exit.

Mortality.—Of 500 cases recorded, 336 died and 163 recovered; a mortality of over 67 per cent. Rupture of the cyst was the most frequent cause, occurring in 174 of the cases, nearly 53 per cent.

Diagnosis.—*Before the fœtal heart can be heard.*—Where, from the first, the patient has a conviction that she has conceived, colicky pains in the hypogastrium or iliac region occur of the most severe character, producing collapse more or less profound, with or without syncope. Where these pains come on in paroxysms, or have

violent exacerbations at more or less regular intervals, with a bloody discharge from the uterus, the existence of extra-uterine pregnancy should always be suspected. If symptoms of abortion supervene, with the discharge of a decidua, or if the phenomena of rupture of the cyst follow the symptoms just enumerated, it is the duty of the practitioner to treat the patient as if she were carrying an extra-uterine child.

Combined vaginal and abdominal examination may reveal the presence of a tumor by the side of the uterus; a sign of the highest importance. But unfortunately there is generally so much tenderness of the parts at this stage of the pregnancy, that it is useless to attempt to derive any knowledge from a physical examination unless the patient be anæsthetized, and even this is not unattended with danger, since the vomiting which it so often causes may lead to rupture of the cyst, the most fatal of all the terminations of misplaced conception. If *ballotement* can be detected, this removes all doubts as to the nature of the tumor. It has sometimes been detected as early as the second month. If the ordinary methods of examination fail, the urethra may be rapidly dilated and the finger passed into the bladder, the index-finger of the other hand being passed into the vagina or rectum, by which means the parts can be thoroughly explored.

Pelvic inflammation, cellulitis, abscess, etc., may be mistaken for extra-uterine gestation, if the clinical history be not carefully noted. Even if the pain be somewhat paroxysmal, the exacerbations are periodical, returning with the menstrual periods. The pelvic swelling differs, too, very considerably from that found in extra-uterine pregnancy, and there is no conviction on the part of the patient that she is pregnant, or any history of amenorrhœa, except of course where cellulitis follows abortion or parturition.

Pelvic Hematocœle.—Here, again, the absence of any history such as will be found detailed elsewhere under this heading, will assist materially in the formation of an opinion. There are no mammary or other symptoms of pregnancy, no increased bulk of the uterus, softening of the cervix, etc.

Retroversion of gravid womb may be easily mistaken for an extra-uterine gestation. The only way of forming a correct opinion is by a careful investigation of the rational and physical signs presented by the patient. The colicky pains, with profound prostration and occasional syncope, are absent in retroversion. There is also an absence of metrorrhagia in the latter, whereas it is frequent in extra-uterine gestation. Retention of urine is much more frequent in the early stages of pregnancy with retroversion than it is in extra-uterine gestation. In the latter, also, the fundus uteri can frequently be felt in front of the gravid cyst, whereas in retroversion it is posterior.

The differential diagnosis in these cases is, however, often very difficult.

Dermoid or piliferous cyst of the ovary has frequently been mistaken for an ovarian conception. The presence of steatomatous

matter, hair, teeth, and even bones in the interior of an ovarian cyst, is not an indication that the woman in whom such a growth is found has ever been pregnant.

Conceptions in the rudimentary horn of a double uterus cannot be distinguished from extra-uterine gestation in the early stages; they run much the same course, but rupture occurs rather later than in cases of tubal gestation. Nothing would be gained, either, if a diagnosis could be made, the indications for treatment being the same under both circumstances.

After the foetal heart can be heard, there is no longer any doubt of pregnancy; it is now a question of intra- or extra-uterine gestation. In *extra-uterine* the gravid tumor is usually developed upon one side of the uterus, which it deflects either to the right or left, or pushes forwards, towards and above the pubes, so that the os is reached with difficulty or cannot be found at all. Retro-uterine fulness associated with displacement of the os uteri forwards and upwards, is of the greatest importance; the detection of the uterus as a hard pyriform body upon the anterior surface of the foetal cyst; deviations of the bladder and rectum; the disproportion between the development of the uterus and the duration of pregnancy, and the abnormal shape of the gravid tumor, the transverse diameter of which is often greater than the vertical, will all assist us in forming a correct opinion. During the progress of spurious labor at term, extra-uterine pregnancy has been mistaken for rupture of the uterus.

Diagnosis after the death of the child may be very difficult, except in those cases where a fistulous communication has formed in the abdominal wall, or the cyst has opened into the bowels, bladder, or vagina.

As a rule, it will be found that all such women have a firm conviction that they were pregnant when the abdominal tumor made its appearance. They will give the history of labor at or near term, attended with uterine hæmorrhage, and followed by the secretion of milk and diminution in size of the abdomen. Under these circumstances extra-uterine pregnancies have been supposed to be *fibroid tumors, ovarian cysts, and cancer of the omentum*.

The absence of the symptoms of pregnancy during the early stages of their development, the absence of false labor at or near the end of nine months, and the steady, regular increase in their size after the end of the usual period of gestation, will serve to distinguish fibroid and ovarian tumors. We should place very little confidence in the statements of patients if they are not in harmony with the physical signs. Encephaloid disease of the liver, mesentery, omentum, and ovaries have been mistaken for an extra-uterine child.

In cases of doubt, the foetus being dead, the trocar has been used to draw off some liquor amnii in order to confirm the diagnosis. This practice cannot be too strongly condemned. Unless it has been decided to operate immediately for the removal of the foetus, the use of the trocar is utterly unjustifiable. A few, but very few,

women have long survived its use. Puncture with either the trocar or aspirating needle is liable to be followed by collapse, peritonitis, or septicæmia, either of which may prove fatal.

Prognosis.—This is always grave. Of all the varieties, that of the abdominal cavity is the most favorable.

The prognosis varies materially with the stage of gestation. It is much graver in the first than it is in the latter half of pregnancy. If a patient reaches the middle of the fourth month without rupture, it is probable that she will go to term. Where rupture occurs, it is almost invariably fatal. At term, when false labor-pains supervene, the prognosis is for a time more unfavorable. This period of increased fatality continues until the patient's system has in a measure recovered from the pseudo-puerperal condition which is induced. The patient sometimes dies suddenly with symptoms of collapse at this period.

After the death of the fœtus, and the restoration of the normal condition of the system, the retention of an extra-uterine fœtus is not incompatible with a long and useful life, but a patient is never free from danger while she is carrying an encysted child. Violent exercise, injuries, blows, strainings, and similar mechanical irritations, may be the exciting cause of inflammation of the sac at any time. Hence, violent pain, with fever, and evidences of inflammation following these, always demands a cautious prognosis.

Depressing diseases, as any of the continued fevers, or local affections which induce a profoundly typhoid condition, endanger the patient by impairing the nutrition of the cyst and leading to destructive inflammation.

Recovery frequently ensues after the discharge of the contents of the fœtal cyst through the rectum, vagina, bladder, or abdominal wall. The last is the most favorable of these terminations; that by the rectum the most unfavorable.

The occurrence of profound prostration, hectic, or septicæmia, during the process of elimination, is always a grave indication. Combined intra- and extra-uterine pregnancy is not more unfavorable than when only one germ is fecundated, and that is developed outside of the womb.

Hernial or extra-abdominal gestation, which is at the same time extra-uterine, is one of the most favorable varieties, both as regards the life of the mother and child.

The supervention of pregnancy in a patient who is carrying an encysted extra-uterine child, while it may produce no bad symptoms, always increases the danger of the patient. The throes of labor may displace and bruise the cyst, and lead to inflammation, suppuration, and purulent or putrid contamination of the blood at a period when the patient is least able to resist these unhappy influences.

The life of a woman who conceives a uterine child, while carrying one outside of the womb, is not so much endangered by accidents occurring during labor as it is by those which may follow it. Experience proves, however, that a woman may safely give birth

to a number of infants while carrying an encysted foetus in her abdomen.

Treatment.—This varies with the stage of gestation :

1. During the first four months. 2. During the remainder of the usual term of gestation. 3. After that period, or after the death of the foetus.

First Period.—Treatment is here palliative, or curative and radical. It is generally for the relief of the colicky pains that we are first consulted. Opium in large doses is most likely to lessen the contractions of the foetal cyst, these being the probable cause of these pains.

Anæsthetics would only endanger the rupture of the cyst, by causing the patient to struggle, or by inducing vomiting.

Morphia may be injected hypodermically; opium administered as suppository or enema by the rectum, applied locally, or given by the mouth.

The patient must be kept strictly quiet; alcoholic stimulants given if requisite, to counteract shock and prevent collapse.

The bowels must be carefully regulated, and the bladder attended to if requisite. If extra-uterine gestation be suspected, the patient should be instructed to avoid all sudden exertion, straining at stool, lifting heavy weights, or any laborious occupation. She should also avoid anything likely to excite the emotions.

The radical or curative treatment is a matter of great importance. Rupture of the cyst will probably occur, and end fatally before the end of the fourth month. To prevent this, and save the life of the mother, it has been proposed to destroy that of the foetus. To accomplish this, various measures have been proposed.

Destruction of the Ovum through the system of the mother.—Starvation, copious and repeated bleedings, purgatives, ergot, iodide of potassium, and mercurial frictions; strychnia, so as to produce the minor toxical effects on the mother; have all been proposed. Dr. Barnes has even suggested syphilization. None of these, however, can be relied upon.

Extirpation of the foetal sac by gastrotomy before rupture occurs has been suggested. The great impediment to operative interference is the difficulty in diagnosis.

Puncture of the foetal cyst.—The death of the foetus is not insured by the discharge of the liquor amnii; puncture with a trocar or aspirator does not therefore hold out any hope of success, and the practice is not without danger to the mother. The trocar should never be used unless it be the intention to remove the foetus at once, either by gastrotomy or other operation, supposing the diagnosis be confirmed.

If the foetus is destroyed in the early stages, the hope for the patient is that it will become encysted and remain quiescent throughout the rest of her life. To do this it is necessary in most instances to maintain the integrity of the cyst walls.

Removal of the Embryo by section of the vagina with the galvanic cautery.—This has been done successfully by Dr. Thomas, of New

York. In all these operations, the placenta should be left *in situ*. Notwithstanding the risk of secondary hæmorrhage and septicæmia supervening, it would seem that this method of treatment offers one of the best chances of success.

Galvanism and Electricity.—An electric current by no means surely destroys the product of conception; it cannot be relied upon in all cases, yet it may prove effectual. One pole of an ordinary magnetic machine may be applied to the tumor in the vagina through an ordinary glass speculum, the other being applied to the surface of the abdomen over the foetal cyst.

Another method is to pass one of the excitors connected with a Leyden jar into the rectum, in contact with the tumor, being careful to avoid the lumbo-sacral plexus of nerves, while the other is passed into the vagina and brought in contact with the anterior, inferior part of the cyst.

Keller opposes the use of electricity in any form, for fear of bringing on contraction of the cyst or the surrounding muscles, and producing separation of the placenta and its consequences.

The injection of narcotic substances into the cyst, such as half a grain of morphia by the hypodermic syringe, has been tried. This treatment, if adopted, should be resorted to as early as possible, with a view to poisoning the amniotic fluid by which the embryo is surrounded. Of the true value of narcotic injections into the cyst, we can say nothing.

Compression of the tumor by bags of sand is at best uncertain; the abdomen is too tender, and there is danger of separating the placenta and causing rupture of the cyst.

Treatment of Rupture of the Cyst in the early stages of pregnancy.—The only remedy that can be proposed to rescue a woman under these unfortunate circumstances is gastrotomy—to open the abdomen, tie the bleeding vessels, or to remove the sac entire. The great impediment to the adoption of this treatment is the uncertainty of diagnosis, and the dread of not being able to arrest the hæmorrhage after the abdomen has been opened. Yet even if the operation be not successful, the surgeon cannot tax himself with having shortened the life of his patient by a single day. Pressure on the abdominal aorta may be tried, when the patient is first seen, to check further hæmorrhage.

There need be no indecision about the method of dealing with the placenta; the whole cyst must be ligated, removed *en masse*, or cauterized. Silk, or carbolized catgut, being animal substances, may be used, cut off short, and closed up in the peritoneal cavity.

If the pregnancy proved to be ovarian, the organ might be ligated and removed. In tubal pregnancy the bleeding surface might be secured by passing a double silk ligature through the broad ligament below the tumor, and tying one strand on either side of the foetal cyst.

Tubo-uterine gestations offer the greatest difficulties, since a portion of the uterus would have to be included in the ligatures, but even this is not incompatible with recovery. The hæmorrhage

may be arrested by means of the galvano-cautery. The galvano-cautery, whenever obtainable, may be used not only to arrest the hæmorrhage, but may be still further utilized in the treatment of these serious cases in removing the cyst.

If necessary to remove the uterus, section must be made through the cervix, the stump being transfixed in the same way as described when speaking of Pean's operation for fibroids. If the uterus be extirpated, the ovaries should be removed at the same time, in order to prevent the danger of another misplaced conception.

After the fourth month, rupture of the cyst is much less likely to occur than before that period. The cyst rarely gives way during the pains of the false labor which occurs at term. At this time the pain must be controlled by large doses of opium. No operation should be performed unless the cyst has ruptured, or the mother's condition becomes so desperate that she must inevitably perish. Extreme prostration may be temporarily counteracted by transfusion.

Gastrotomy, for the extraction of an extra-uterine child, has been advocated and condemned with equal warmth. The primary operation, where the life of the child is considered in determining the time for interference, cannot be too emphatically condemned. It adds only another danger to a life already trembling in the balance, which the delusive hope of saving the uncertain life of a child does not warrant us in assuming, and is therefore unjustifiable.

The secondary operation, performed some time after the death of the child, when the system of the mother has recovered to a great extent from its puerperal condition, affords the mother increased chances of life. It is not, however, to be resorted to indiscriminately. It should be postponed as long as possible, until there is some very obvious indication for interference. Extra-uterine foetation cysts ought not, as a rule, to be meddled with in any way, either by puncture or incision, until suppuration has occurred and an abscess fistula been formed. This rule must not be too universally applied.

Before operating the bowels should be well cleared out, a dose of opium being given afterwards to allay all excess of irritation. Anæsthesia being then produced, an incision is made in the median line, unless there are special indications to the contrary. The incision should be long enough to ensure facility in extracting the child, providing this does not involve cutting beyond the adhesions and exposing the peritoneum. Rather than incur this danger, the child should be broken up and extracted piecemeal by means of strong scissors or forceps. After a small opening has been made the finger may be passed into the cyst in order to feel from within for evidences of adhesion. The incision can then be enlarged in accordance with information thus obtained, the child seized by the feet and extracted.

If no adhesions are found in cutting through the abdominal walls, or if the cyst be torn in removing the child, the wound in the latter should be stitched to the abdominal parietes throughout its whole length.

If an extra-uterine child has been retained for a long time, different portions of its body may contract more or less intimate adhesions with the cyst in which it is contained.

Management of the Placenta.—The same rules will govern the operator whether he is performing gastrotomy, enlarging an abdominal opening, or extracting by section of the vagina.

The removal of the placenta is attended with very great danger. The part to which it is attached necessarily becomes very vascular, and there is no hope of arresting the hæmorrhage by the ordinary mechanical means on account of the extent of the surface and its situation, often in the deepest parts of the abdominal or pelvic cavities. On the other hand, if the after-birth is allowed to remain, it has to be removed by disintegration. This leads to blood-poisoning, pyæmia, or septicæmia, the most formidable complications of operative surgery.

Professional opinion is still unsettled as to which plan to adopt. In addition to hæmorrhage, rupture of the cyst is another danger which may follow attempts to remove the placenta.

The conclusion is irresistibly forced upon us that the placenta should be left after the removal of an extra-uterine fœtus, and the tendency to pyæmia and allied disorders combated by injections into the cavity of the cyst, drainage, etc.

The *placenta* may separate at any time between the operation and the eighth or tenth day following it. The cord should be left hanging from the wound, and traction upon it made occasionally. The position of the placenta should be determined if possible before commencing the operation of gastrotomy, as also the position of the bladder, a catheter being introduced and the urine withdrawn.

Removal of the cyst wall is not advisable. If free, it should be stitched to the abdominal wall in order to shut off the peritoneal cavity. If adherent, death would probably occur from hæmorrhage or shock.

Gastrotomy by the use of caustics, with the view of securing adhesions between the cyst and abdominal walls before opening the former, may be tried in those cases in which adhesions are supposed to be absent. This method has not yet been resorted to sufficiently often to warrant any conclusions in regard to its usefulness.

Treatment after gastrotomy, whether by knife or caustic. The dangers to be avoided are shock and collapse in the first instance, or later from peritonitis—acute or sub-acute—and septicæmia.

The patient must be most carefully watched, and every means taken to prevent accumulation of septic matter in the cyst. Whether drainage through the abdominal wound, through the posterior *cul-de-sac* of the vagina, by means of puncture and the insertion of a drainage-tube, or the injection of a cyst with antiseptic fluids be resorted to, will depend upon the nature of the case and the progress after operation.

Gastrotomy after death of mother, in the interests of the child, has been attempted, but not hitherto with success.

It may be well to mention that the post-mortem examination of the patient should not be proceeded with immediately after the removal of the child, as has been done in several instances.

Vaginal incision, through Douglas's pouch, with a view to extracting the child entire or piecemeal, if resorted to at all, should be confined to cases in which adhesions are supposed to be absent, and in which either the cephalic or pelvic extremities of the child can be felt through the canal. If the child occupies a transverse position in the abdomen, and has to be delivered by version, gastrotomy should always be performed in preference to section of the vagina, in order to prevent rupture of the cyst wall. Experience thus far indicates that, notwithstanding the brilliant success which has happily followed it in a few instances, the chances of the patient recovering are not so great after vaginal incision as they are after gastrotomy.

The placenta should be left *in situ*, and the wound should be left open to give egress to the discharges, and to the placenta when it separates.

Delivery by incising the rectum has not yet met, nor is it likely ever to meet, with favor. It has no advantage over section of the vagina, while delivery would be far more difficult.

Treatment after the Death of the Fœtus at Term.—After the termination of spurious labor the patient must be carefully watched, more with the view of relieving symptoms than of interfering actively. The results of surgical intervention have proved that the expectant treatment is the most successful. Pain is to be relieved by narcotics, and the patient's strength sustained by a generous diet and tonics.

If septicæmia, peritonitis, or exhaustion endangering life, or rupture of the cyst should supervene, gastrotomy is indicated; otherwise nature should not be interfered with until she indicates the channel by which elimination is to be effected. If the sac opens through the *abdominal walls* the orifice should be enlarged, and the fœtus or its *débris* extracted. The procedure is unattended with danger, and saves life by removing a source of putrid infection, and greatly shortens the duration and the suffering of the eliminative process. In the same manner, when the cyst opens into the *vagina*, the orifice may sometimes be enlarged and the child extracted.

In cases where the communication is high up in the *rectum*, the difficulties of removing the fœtus are so increased as to make the operation of enlarging the orifice dangerous. Most operators prefer gastrotomy.

If the process of elimination is taking place through the bladder, many of the smaller bones may be removed without having to resort to lithotomy. The female urethra is very dilatable; yet if the sac be found to be adherent to the abdominal wall, gastrotomy will be found less dangerous, as the larger incision which can be made in this operation renders the extraction of the parts of the fœtus easy, without endangering the integrity of any delicate organs.

Tubo-uterine Pregnancy.—If this can be diagnosed during life, the cervix uteri may be dilated, and the child removed by incising the septum which divides the true and the vicarious uterine cavities.

Treatment of Combined Intra- and Extra-uterine Pregnancy in Labor at Term.—As a rule, labor progresses normally in these cases until the intra-uterine child is born. Where the extra-uterine tumor fills up the greater part of the pelvic brim, and is immovable, so that it cannot be pushed aside and delivery of the intra-uterine child be accomplished by version or otherwise, it may be necessary to resort to craniotomy or Cæsarean section.

After safe delivery of the intra-uterine child, the operation of primary gastrotomy should be emphatically condemned. More human lives will be saved by expectancy than by active interference. Until all hopes of the mother's life have been dissipated, we should not make any effort to save the child.

Treatment of Labor in a Patient Carrying an Encysted Child.—These labors are rarely difficult, but should they be we must decide between elevation of the tumor and extraction by version, or the forceps, perforation, and the Cæsarean section.

Treatment of Extra-uterine Hernial Pregnancy.—Here the child is contained in a hernial sac, extra-abdominal and extra-uterine, chiefly inguinal, the abdominal cavity remaining intact, even though the cyst has a peritoneal covering.

Gestation should be allowed to go to term, when the child should be removed by section of the sac, with the hope of saving both the mother and the infant.

The placenta should be allowed to remain. The fluids resulting from the decomposition of the after-birth can be much more easily washed out than when they are formed in, or gravitate into, the deeper portions of the abdominal cavity.

CHAPTER XXV.

DISEASES OF THE VULVA.

Diseases of the Vulva.—These comprise affections of the mons veneris, labia majora and minora, clitoris, meatus urinarius, fossa navicularis, fourchette, and hymen.

The vulva is freely supplied with a rich and complex vascular apparatus, and sentient nerves having an active reflex association with the cerebral and spinal nervous centres, so that it is not surprising that many of the diseases affecting this part are attended by exquisite pain.

Eruptive Diseases of the Vulva.—Of these, acne, erythema, erysipelas, eczema, herpes, prurigo, lichen, and syphilides may be mentioned.

Acne is due to engorgement of the sebaceous follicles studding the surfaces of the labia.

Treatment.—The inunction of a little of the iodide of sulphur ointment, the application of a weak solution of perchloride of mercury, with attention to cleanliness, will often be sufficient to effect a cure.

Erythema is a simple hyperæmia of the skin, due generally to local irritation from discharges from the vagina or friction of the opposed surfaces, especially in fat women and children.

Treatment.—Attention to cleanliness, keeping the parts dry with some powder, or the application of some astringent lotion, will usually suffice to relieve the condition.

Erysipelas is seldom met with confined to the vulva alone, and must be treated on general principles.

Eczema vulvæ often occasions considerable distress from smarting, soreness, and pruritus. It affects the labia majora chiefly, and may extend to the nymphæ and vulva, or to the adjacent parts of the thigh and abdomen. It is usually the form known as eczema rubrum.

It may be due to some leucorrhœal discharge, to incontinence of urine in gouty subjects, in cases of vesico-vaginal fistulæ, or in diabetes. In very fat patients, who perspire freely and are not very cleanly in their habits, it is by no means infrequent, extending round to the anus and causing painful, irritating fissures.

In long-standing cases the skin often becomes thickened, and there is loss of hair on the affected part.

Treatment.—If leucorrhœa exist, it must be removed if possible.

In gouty subjects, alkaline remedies may be tried internally.

In diabetes, careful ablution after micturition and constitutional remedies should be employed.

Where dribbling of urine occurs, this must be obviated if possible, and the parts protected by oiling them.

In very fat persons, cleanliness and keeping the skin dry are often sufficient; or lead lotions, glycerin and borax, or an ointment of acetate of lead gr. x, liq. carbonis detergens \mathfrak{m} x-xv, and vaseline \mathfrak{z} j, may be tried.

In obstinate chronic cases there is nothing like modifying the condition of the skin by brushing it over with a strong solution of nitrate of silver (\mathfrak{z} ij-iv ad \mathfrak{z} j), caustic potash (\mathfrak{z} ss-j ad \mathfrak{z} j), or carbolic acid and glycerin.

Herpes consists of numerous little papules and transparent vesicles. They often extend from the inner surface of the thigh to the vulva. The eruption is usually accompanied by some febrile disturbance or disordered digestion, and pruritus, or a burning sensation. Occasionally vesical or rectal tenesmus are noticed, as also pain in the limbs.

The vesicles rupture, and are then transformed into superficial excoriations, which remain bare or are covered with brownish crusts. The disease usually runs its course within seven or eight days, but successive groups of vesicles may appear, and thus the eruption may last for many weeks, or even months. Herpes gestationis is often prolonged by relapses.

Treatment.—Constitutional remedies in the form of aperients, antacids, and tonics may be indicated.

Locally, cleanliness, astringent washes, dusting the surface over with a powder of camphor and bismuth, or an ointment of vaseline with the oxide of zinc, will prove of service.

Prurigo is a chronic papular disease of the skin, accompanied by intense irritation. It is very intractable. Arsenic is sometimes of use.

Locally, nitrate of silver or caustic potash applied to the papules is often of service. This disorder is often confounded with pruritus.

Lichen presents more numerous papules, resting upon a thickened and somewhat indurated base.

Strict attention to cleanliness, ointments or lotions of hydrocyanic acid, liquor carbonis detergens, etc., with arsenic internally, are most calculated to be of service.

Syphilides may generally be recognized by the tendency to present several types simultaneously—macular, papular, and squamous; by their coppery tint, tendency to leave brown stains, a disposition on the part of the ulcerated forms to spread in a characteristic serpiginous manner, by the history and special cachexia.

The constitutional treatment, by mercury, iodide of potassium, etc., and locally black wash, dusting with calomel, etc., will need to be resorted to.

Sensitive Red Patches, often associated with vascular caruncle of the urethra, are occasionally found about the time or shortly after the climacteric period. They are always confined to the mucous membrane on the inner surfaces of the nymphæ, and have not been observed on the labia majora or in the vagina higher than

the vestibule. It is a very distressing complaint, and one of the most intractable.

If the patient be placed in the dorsal position and the vulval orifice distended, one or two spots, varying in color from a palish brick-red to a bright purple, will be observed on the mucous surface of the nymphæ, exhibiting a tendency to bleed, exquisitely sensitive to the touch, and slightly depressed below the level of the normal mucous membrane. These spots are transitory and spread in a serpiginous manner, a peculiar degenerative and atrophic change seeming to take place, so that the red color, after lasting for some months, either entirely disappears from one spot and comes out at another, or disappears from the old site as it progresses towards the new. This process is very slow, but, as Mr. Lawson Tait, who has specially described them, states, it explains the intractable nature of the disease, which is seldom content until it has passed over the whole mucous surface of the nymphæ. During its progress the vestibule of the vagina slowly contracts until it may be so reduced as barely to admit a finger, even though the patient has borne several children.

On microscopic examination of a small fragment of the mucous membrane containing a patch of this vascular change, Mr. Tait found that at the site of the spot all the textures had been removed save a few fibres, the walls of the capillaries and the superficial epithelium, under which the loops of capillaries with thin and dilated walls lay almost unprotected. Nerve-fibres in a similar condition were also found lying amongst the capillaries.

It is a progressive atrophy of the mucous membrane, the last textures affected being the blood-vessels and nerves. When the process has been completed the pain ceases, the redness disappears, and nothing remains but a vestibulum vaginæ so narrow that incredulity may be excused when the patient states that she has borne children.

Symptoms.—A slight yellow discharge, scalding on micturition, inconvenience in walking, and excruciating agony on any attempt at intercourse.

Treatment.—Great relief is obtained, though only temporary, by the application of strong carbolic acid to the red spots. This being a powerful local anæsthetic, it never fails to mitigate the tenderness for a time. The application of a plug of cotton-wool, soaked in a saturated solution of neutral acetate of lead in glycerin, placed between the nymphæ at bedtime, is generally successful in procuring some relief. The progress of the disease is slow, often extending over many years. A little dry cotton-wool inserted from time to time just within the vaginal orifice often proves of service in preventing inconvenience from walking. Any catarrh of the cervix or vagina should be attended to, as the presence of any irritating discharge unquestionably aggravates the discomfort.

Warts do not necessarily imply syphilitic contagion. They may be due to continual moistening of the parts with unhealthy discharges. They occur as small excrescences just at the junction of

the skin and mucous membrane, and consist of a localized hypertrophy of the papillæ and the epidermis covering them, being usually pedunculate.

They are generally soft when situated on the mucous membrane, owing to their being kept constantly moist by secretions, though they do not themselves secrete a discharge that will reproduce them on other individuals. Gonorrhœa seems to be a frequent exciting cause of their production, though a peculiarity of constitution or a certain predisposition is necessary as well. Occasionally they grow to a very large size.

They seldom cause pain, but may produce local irritation and discharge.

Treatment.—Small warts may be snipped off by means of curved scissors, the base being touched with arg. nit., acid. nitric., or other caustic. Where any cutting operation is objected to, they may frequently be removed by the careful application of the carbolic, nitric, chromic, or glacial acetic acid.

The strong liq. plumb. subacet. applied daily is painless, and causes them to dry and wither slowly.

Dusting them over and keeping the surface very dry with a powder of zinci oxidi and acid. tannici, or bismuth and chalk, or calomel and magnesia, will frequently prove sufficient to check their further growth. When any large surface is involved, it may be necessary to give an anæsthetic, and either snip them off with curved scissors or remove them with Paquelin's, the galvano-cautery, or other form of cautery. If any syphilitic taint exist, the administration of mercury internally and the application of black wash, or mercurial ointment, may be requisite.

M'Clintock describes a variety of warts which grow from the vestibulum, meatus urinarius, carunculæ myrtiformes, or some of the parts ordinarily concealed within the vulvar sinus. They have a firm structure, but are remarkably pale in color, and semi-transparent like the white muscular tissue of fish.

Considerable hypertrophy of the nymphæ, clitoris, and even the labia majora is not unfrequently associated with these warty excrescences, suggesting the probability of their being due to some venereal taint. The syphilitic hypertrophy is generally marked by a rugous warty surface, and there is collateral evidence of syphilis being present in the system.

Hypertrophy of the labia and nymphæ, smooth and uniform, may occur, when no warts exist, and where there is no evidence of any syphilitic taint.

Should the enlargement be so great as to interfere with locomotion or produce much discomfort, it may be necessary to remove it by the écraseur or by other mode of operation.

Condylomata, or *mucous tubercles*, are evidence of constitutional syphilis. They usually occur as large, flat, soft, uniform structures, growing irregularly round the orifice of the vulva in the form of smooth elevations, sessile, with a broad base, not pedunculated as occurs in non-specific warts.

They are generally bathed with a profuse offensive mucous discharge, which is essentially contagious in its nature.

Treatment.—Anti-syphilitic remedies, such as the liq. hyd. perchl. 5j, etc., should be given internally. Locally, the nitrate of silver, acid nitrate of mercury, or carbolic acid may be rubbed freely over the surface.

The parts should be kept separate by a piece of lint saturated in lotio hyd. nigra, frequently renewed, or the surface may be kept dry by dusting it over repeatedly with a powder of calomel and magnesia, equal parts, a fold of lint being placed in the cleft to keep the contiguous surfaces separate.

Strict cleanliness must be enjoined. Any vaginal discharge should be attended to. A tampon of cotton-wool, inserted just within the vagina, will prevent any discharge running down and irritating the vulval outlet.

Elephantiasis of the vulva is very rare in this country, although it is spoken of as being epidemic in the Barbadoes Islands. It is more often observed in tropical countries than in the temperate zones.

The labia may become so hypertrophied that they hang down to the middle of the thighs in the form of tumors. It may also affect the nymphæ, clitoris, and the perineum.

The disease consists in hypertrophy of the subcutaneous cellular tissue and skin. The surface is generally brownish, irregular, with numerous tuberosities or vegetations due to hypertrophy of the cutaneous papillæ. Superficial ulcerations often occur which leave indurated and callous cicatrices.

It is chiefly troublesome to the patient by the weight and interference with locomotion. The ulcers which form on the surface are often very painful; where these do not occur the affection is not painful, and may last many years without exerting any injurious influence upon the constitution. It may develop to a certain extent and then remain stationary, again becoming quickened into activity should conception occur.

The development of elephantiasis has been attributed to chlorosis, scrofula, and constitutional syphilis, but nothing very definite has yet been proved.

Treatment.—Various measures have been tried to arrest the development of this disorder. Ligature of the feeding vessels has been recommended, but with such slight success as hardly to warrant its general adoption. Extirpation of the tumor has been resorted to, but relapses are by no means infrequent. If incisions are made into the diseased structures, cicatrization takes place with difficulty, or is completely prevented by the ulceration of the wound or its surroundings, which may prove fatal by producing rapid marasmus or pyæmia.

Oozing tumor of the labia is a rare condition, met with most frequently in fat, middle-aged women, who have been weakened by bearing children. It consists in an irregular papillary or cauliflower-like growth, springing from one or both labia. It is generally confined to one side.

The labium is found to be enlarged, being firm, smooth, and somewhat lobulated. There is a profuse secretion from the mucous follicles, occasionally acrid, excoriating the neighboring parts, and of an exceedingly offensive odor. It produces a sensation of heat and irritation, especially after exercise, when the itching is often very troublesome.

Treatment.—Rest. Generous diet. Tonics. Astringent lotions and attention to cleanliness should be first tried. Should these measures fail, it would be necessary to excise the labium.

Lupus of the Vulva.—*Esthiomenus*, *herpes exedens*, rodent ulcer, tertiary syphilis, are the various names that have been applied by different authors to a chronic affection of the vulva, often confounded with cancer, syphilis, and elephantiasis. Huguier divides the disease into three categories—the superficial, the perforating, and the hypertrophic forms.

It is not very common, occurring most frequently between the ages of twenty and thirty-five, in women with constitutions enfeebled by want, bad air, bad food, and other unhygienic surroundings.

The chief characteristics of the disease are thinning of the skin, hypertrophy and knotty condition of the subjacent cellular tissue, formation of induration and enlargements, ulcerations and contractions. The ulcers form slowly, the surface healing in one place whilst it is ulcerating in another. The disease is chronic, and is seldom painful. There are often considerable contractions remaining when the ulcers heal.

At first a bluish-red color of the skin of the mons veneris and labia is noticed; this is smooth and rather shining, and covered with small scales. Tubercles, isolated or close together, then develop; they are flat, of a dull-red or violet color, oval or round, soft, and not tender to the touch. The intervening skin is nearly healthy. These tubercles may remain in a chronic state without any change for a long time, but ultimately they approach, coalesce, soften, and suppurate in the centre. From this point the ulcer spreads slowly but surely, in no definite direction, either superficially or deeply eating away the softer parts within the vulva, about the perineum or rectum, with a frightful amount of destruction.

The skin and subcutaneous tissue are both hypertrophied and infiltrated, ulceration and destruction going on at the same time.

There is little or no constitutional or local suffering, no pain nor tenderness, some little itching occasionally, but rarely heat; menstruation is regular; micturition gives no pain, and even sexual intercourse is not distressing in the early stages.

Only when the ulceration has involved the urethra, and the orifice of the vagina, when there are fissures, ulcers, and crevices, large tumors between the thighs, with induration and contraction of the rectum, does the patient emaciate. The digestion becomes deranged, colliquative diarrhoea sets in, and the patient dies in a state of marasmus, but only after a long duration of the disease. Peritonitis may result from ulceration of the intestinal canal.

Diagnosis.—The disease may be considered an epithelioma or canceroid, and not cancer. It differs from simple hypertrophy and elephantiasis in its history, duration, and the fact of ulceration; from cancer and some forms of syphilis, from the absence of local and constitutional suffering.

Treatment.—Complete recovery is rare, though much may be done to alleviate. The administration of the bromide of mercury, steadily persevered in, seems to be of service. The local and internal use of iodine, or iodoform, are also efficacious. The destruction of the surface by means of potassa fusa, the actual cautery, or fuming nitric acid, may be tried.

If these means fail in arresting the spread of the disease, extirpation of the nymphæ or adjacent parts, and the application of the actual cautery, may be advisable.

Undue constriction of the vaginal or anal openings must be guarded against by the passage of bougies and other appropriate means.

Cancer of the Vulva, as a primary affection, is comparatively rare, but occurs more often than is the case in the vagina.

Epithelioma is the more usual form. It may commence in any part of the external generative organs, but is most frequently met with near the clitoris, or affecting one or other labium, as a small indurated tubercle, which causes a certain amount of itching and smarting, but does not appear to be painful at first.

After some months' duration the surface becomes ulcerated; the ulceration then spreads rapidly, the edges are indurated, and there is usually an ichorous discharge.

The inguinal glands subsequently become affected, the characteristic constitutional cachexia becomes developed, and the case proceeds to a fatal termination.

Barnes speaks of *epidermal cancer* (canceroid) as a proliferating, widely-spreading degeneration of the labia or clitoris. When this latter organ becomes affected, owing to its almost external position, and the distress which the disease and the attendant enlargement produce, it is generally detected early. These circumstances make ablation especially hopeful.

Medullary cancer occurs very rarely as a primary disease of the labia, but is more usually an extension of disease from the uterus and vagina, or from the inguinal glands.

Melanosis of the labia and vagina has been observed.

Treatment.—If detected and diagnosed sufficiently early, the mass should be at once excised, either by means of the galvano-cautery, or excision with the knife or scissors, care being taken to include a margin of healthy surrounding tissue, if possible.

Hæmorrhage must be controlled by the actual cautery, the application of the perchloride of iron, or by compresses and firm pressure.

If the neighboring tissues be infiltrated, it may be too late to attempt removal with any hope of the disease not recurring. The employment of bromine or other strong caustics may then be tried.

Edema of the labia majora or nymphæ occasionally occurs as a complication of anasarca due to organic disease of the heart, liver, and kidneys, but may also be due to pregnancy. The distention is usually symmetrical, or uniform on both sides. At first there is little or no pain, merely inconvenience in sitting, micturition, etc. The swelling is smooth, tense, shining, pitting on pressure, often becoming excoriated where the contiguous surfaces touch, when smarting or burning pain may be experienced.

Treatment.—Rest in the horizontal position, emollient applications, evaporating lotions, brisk aperients. Should these measures fail, the introduction of Southey's drainage-tubes, to allow of the fluid gaining exit, should be resorted to. Where this condition is present during parturition, puncture in several places with a lancet or surgical needle will soon reduce the œdematous condition.

Examination of the urine and attention to general treatment should never be neglected. Pulv. jalapæ co. (ʒj-5ss) hot-air baths, milk diet, liq. am. acet., with or without iron, depending upon the constitutional disorder, will generally be indicated.

Hydrocele occurring in the vaginal canal is exceedingly rare. The peritoneal covering of the round ligaments is occasionally prolonged through a portion of the canal, constituting the canal of Nuck. Ordinarily this is obliterated in adults, but occasionally it remains permanently open, and an increased secretion causes a collection of fluid, which, if the opening has become impervious, becomes sacculated.

Treatment.—If the diagnosis be clearly established, evacuation of the fluid may be accomplished by the employment of the hypodermic syringe, or aspirator. Iodine may then be injected, as in an ordinary case of hydrocele.

Cystic Dilatation of the Vulvo-vaginal (Bartholini's) Glands.—These glands are situated just anterior to the hymen, on either side, opening by small ducts on the surface, sufficiently large to admit a bristle. The duct occasionally becomes occluded from some trifling inflammation; the secretion of a clear, glairy fluid, in place of finding exit, thus becomes pent up and distends the gland, which may become as large as a bantam's egg. As a rule, the only inconvenience complained of is a discomfort in walking and inconvenience on coitus. On examination a tense, fluctuating cyst is detected.

Treatment.—Mere puncture is not sufficient. The cyst must either be laid freely open, or a seton passed through it and kept in until the cavity heals up by granulation. A safer plan is to produce anæsthesia and dissect the cyst out carefully. An incision is made carefully, so as not to injure the cyst. This is then dissected out by tearing with the handle of the knife. The cavity is plugged with carbolized oil lint, and a strict cleanliness enjoined until the cavity has healed by granulation.

Vulvitis, or inflammation of the vulva, may be a simple purulent catarrh, as not infrequently met with in strumous and delicate children, when suspicion is often excited that they have been tampered with and inoculated with gonorrhœal contagion. It is

commonly due to a neglect of cleanliness or the irritation of threadworms, and is often aggravated by the rubbing employed with a view to allay the irritation.

Strict cleanliness, bathing with warm water, the use of an astringent lotion containing alum, or zinc, or borax, together with tonics and aperients, good food, iron, and cod-liver oil, will generally suffice to cure the disorder. The application of a strong solution of nitrate of silver or of carbolic acid is occasionally requisite.

Purulent vulvitis may arise from extension of gonorrhœa from the vagina, or may be non-specific, and due to uncleanness, immoderate coitus, onanism, friction, or injury. It is frequently associated with eruptive disorders of the vulva and acrid discharges from the vagina.

There is seldom any marked febrile disturbance, but generally considerable local irritation, the parts being dry, red, hot, and swollen. Later on the surface is bathed with an irritating purulent discharge of a singularly offensive odor.

The surrounding parts are excoriated by the secretion, and occasionally intense pruritus is present.

The purulent secretion is so irritating that balanitis or even urethritis may be produced in the male from contact with it. Occasionally the discharge sets up urethritis, cystitis, or vaginitis in the patient herself by extension of the inflammatory process, and abrasion or ulceration of the surface may also ensue. Fissures are not infrequently produced by the scratching resorted to with a view to allay the irritation. Vaginismus is a frequent result.

Treatment.—Scrupulous cleanliness, frequent ablutions, low diet, rest in the recumbent position, saline aperients, and soothing applications are the chief indications. Warm fomentations, frequently renewed, as long as the parts are swollen and inflamed, should be followed by the application of some sedative lotion, such as lead and opium (tinct. opii ℥j, liq. plumbi subacet. ℥ss, aq. rosæ ℥vjss); borax (glycer. boracis ℥ij, liq. morphinæ acet. ℥j, aq. rosæ ℥v); or with acid. hydrocyan. dil. ℥ij in place of the morphia. When the inflammation has somewhat subsided, the occasional application of carbolic acid and glycerin, equal parts, or nitrate of silver, (gr. x-xx, or even ℥ij, ad ℥j aquam) will often prove of much service.

Dusting the parts over with a powder composed of camphor ℥ss, spir. vin. rect. q.s., bismuthi carbonat. ℥ss, pulv. amyli ℥ij; or with zinci oxidi ℥ss, pulv. amyli ℥ij, will allay irritation and promote recovery. Care must, however, be taken not to allow the powder to become incrustated on the surface, should the discharge continue.

A lotion of black wash, or carbolic acid, is also of service in allaying irritation. Any vaginal discharge must be attended to and remedied if possible; a plug of cotton-wool, inserted just within the vagina, to prevent any discharge coming down, is a useful plan.

Follicular vulvitis is applied to that form of inflammation in which either the mucous or sebaceous glands, or both conjointly, are chiefly affected.

It is not infrequently met with in early pregnancy, and may be due to similar causes, as already mentioned when speaking of purulent vulvitis.

Symptoms of irritation of the vulva, with burning heat, itching or intense pruritus, and increase of the glandular secretion, often of a very offensive and irritating character, are usually present.

Physical Signs.—Where the mucous glands are mainly affected, the mucous membrane of the vulva is seen to be inflamed, especially the internal surface of the nymphæ and the vestibule. Small elevated spots, intensely red and painful, often bleeding on the slightest irritation, may be detected.

Where the sebaceous glands are most implicated, small rounded papillæ are noticed on the surface of the labia and at their junction anteriorly. These inflame and suppurate, the follicle then shrivelling up. An offensive sebaceous secretion often covers the surface and prevents the follicles being seen.

Course and Termination.—It is often very intractable, continuing throughout pregnancy, and even being so severe as to induce abortion by the intense pruritus it occasions.

In the non-pregnant it may continue indefinitely, unless treated appropriately, producing vaginismus. Urethritis in the male may be excited by the secretion, and thus give rise to serious recriminations between husband and wife.

Treatment.—Similar precautions to those enjoined in the purulent form must be pursued. Touching the inflamed points with the nitrate of silver or carbolic acid in chronic cases is often of service. An ointment of hydrocyanic acid $\mathfrak{5j}$, liq. plumbi subacet. $\mathfrak{3ss}$, vaseline or cocoa butter $\mathfrak{5j}$; or either of the formulæ previously suggested, will generally succeed in relieving the irritation.

If leucorrhœa co-exist, this must be remedied before we can hope to establish a permanent cure of the vulvitis.

Gangrenous Vulvitis.—Gangrene of the vulva, or noma, resembles in many respects the cancrum oris, and like this is occasionally met with in cachectic children, especially as a sequela of severe zymotic diseases. It is fortunately a very rare affection, as it is generally a fatal one. It may occur epidemically, and has been observed as a very fatal complication in some epidemics of puerperal fever. Velpeau describes it as commencing as a patch or vesicle of grayish, reddish, or blackish hue, which ulcerates and soon becomes depressed in the midst of swollen and indurated tissues.

The gangrene advances, mortification affects the parts and continues sometimes to extend until death supervenes.

Treatment.—The most nutritious food, with wine or brandy, must be administered, quinine and iron prescribed. Locally, the actual cautery or nitric acid must be applied, to destroy the gangrenous spot.

Disinfectant poultices should be frequently repeated.

Iodoform freely applied twice daily has been well spoken of.

Inflammation and Abscess of the Vulvo-vaginal Glands.—This gen-

erally results from gonorrhœa, but may be due to vulvitis, especially if cleanliness be not attended to.

The inflammatory process, when confined to the gland and its duct, causes obliteration of the latter, as a rule, and an abscess generally results. There is usually more or less febrile disturbance, with throbbing and pain in the part, often intense, aggravated on micturition, movement, or coitus.

On examination, a tense, exquisitely painful, fluctuating swelling is detected at the posterior and external portion of the labium majus, varying in size from that of a marble to a pigeon's egg, or even larger. The swelling bulging over to the opposite side occludes more or less the entrance to the vagina, so that the introduction of the finger is attended with difficulty.

When suppuration occurs, the accumulating pus may gain partial exit through the duct, and then the cavity refill, or the abscess may burst, or remain in a chronic state for an almost indefinite time.

In any case it is apt to become chronic, an obstinate secretion of pus going on for many months or years, or fresh inflammation may be at any time set up from some trifling injury, which may extend to the adjoining cellular tissue and cause a considerable increase of the swelling.

Treatment.—At first, rest, leeches, warm hip-baths, fomentations or poultices. If much constitutional disturbance occur opiates may be employed. Should the inflammation not subside but run on to suppuration, as soon as fluctuation be detected the abscess should be laid open by a tolerably free incision. Even if hæmorrhage occur for a time it should not be checked too hurriedly, as it affords marked relief, but if too profuse it must be arrested by compresses, cold, or a pledget of lint soaked in perchloride of iron. The incision should be made parallel with the long axis of the labium, on the inner surface, lest the transverse artery of the perineum be injured. If this latter accident occur, it may be necessary to ligature both ends.

Fomentations or poultices should be applied after the incision, and the cavity should be stuffed with carbolized oiled lint.

Where the gland goes on secreting a glairy, tenacious mucus mixed with pus, the cavity should be stuffed with lint soaked in tincture of iodine, so as to encourage shrivelling up of the cyst and healing by granulation. Nitrate of silver has been employed for the same reason.

Where the abscess is allowed to burst spontaneously, or where too small an opening has been made, fistulous tracts often form. The irritation and discharge are kept up; induration of the neighboring tissues occurs. A free incision must be made, and the sac stimulated with iodine, carbolic acid, nitrate of silver, or other similar agent.

Phlegmonous Inflammation of the Labia Majora.—This may be the result of direct injury, or proceed from exposure to cold and draughts in patients predisposed to the formation of furuncles

and carbuncles, or from excess in coitus, or from scratching in cases of pruritus and inoculation with acrid discharges. The ordinary symptoms of inflammatory mischief declare themselves—heat, pain, swelling, followed by suppuration and formation of abscess. The pus is often very offensive.

There is generally throbbing, aching, or shooting pain, increased on standing or walking, with exquisite sensitiveness upon pressure. On examination, one labium is found to be much swollen, hard and tender. Care must be exercised not to mistake it for a labial hernia, pudendal hæmatocele, or displaced ovary.

Treatment.—At first, perfect rest, saline aperients, and cooling lotions may be tried; but if suppuration be inevitable, it should be encouraged by fomentations and poultices. Early evacuation of the contents of the abscess should be secured by a free incision as, the tissues being lax, the abscess may attain a large size before bursting, or the pus may find its way upwards towards the abdominal ring.

Furuncles of the Labia.—Boils may occur in the labia as well as in other parts of the body, and occasion much irritation and distress. They are very apt to recur, one forming as another is healing, proving very obstinate and troublesome. In some instances they seem to be due to suppuration of sebaceous glands, varying in size from that of a small pea to that of a marble.

Occasionally a small cribriform opening gives exit to a portion of the enclosed matter, but the sac of the abscess, in place of contracting, goes on secreting, the surrounding tissues becoming much indurated.

When once these little boils have been present for some time they are often very troublesome to deal with.

Constitutional remedies in the form of tonics—iron, arsenic, quinine, cod-liver oil, and aperients, etc.—may prove of service but local treatment is very important.

Each little abscess should be opened freely with a lancet, a crucial incision being made to prevent the aperture closing. Poultices or fomentations should then be applied, and strict cleanliness enjoined. Touching the sac of the abscess with the glycer. ac. carb., or the nitrate of silver, is often of service. Stimulating the surface of the labium by painting it with tincture of iodine seems also to be beneficial in some instances.

Varicose dilatation of the veins of the vulva is generally the result of pregnancy, when a considerably augmented afflux of blood is determined to the vaginal and pudendal plexuses, at the same time that there is frequently an increased obstacle to its return from the pelvis. This condition may, however, occur independently of pregnancy, or persist after parturition. Rupture of the gorged vessels may occur spontaneously, from coitus, from straining in the act of defæcation, from injury during parturition, from a kick or other injury, and profuse or even fatal hæmorrhage occur.

Treatment.—Where this condition occurs, the bowels must be carefully regulated; an abdominal belt may prove of service in

taking off pressure from the pelvis during the latter months of pregnancy; the patient must be enjoined to rest up and avoid all sources of straining, injury, etc. Where rupture and hæmorrhage occur, firm pressure should be applied by pressing a silk handkerchief up the vagina, and then plugging this canal, continuing the pressure by pads and a T bandage as far as may be necessary externally. If pressure fail, some styptic, such as the liq. ferri perchlor., must be applied to the bleeding rent.

Pudendal hæmorrhage may occur from rupture of the bulbs of the vestibule, the skin also being ruptured, so that free hæmorrhage externally takes place. The accident, though rare, has yet proved fatal. It has been caused by severe muscular efforts, kicks or blows rupturing vessels by bruising them against the pubic bones, incisions or punctures, and other injuries.

Treatment.—Rest, pressure, cold, astringents, may first be tried. If these fail, plug the vagina, and apply a pad with a T bandage firmly compressed. If hæmorrhage persist, enlarge the wound, and stuff it with pledgets of cotton-wool or lint, steeped in liq. ferri perchlor., and then reapply pressure by the T bandage.

Pudendal hæmatocèle, hæmatoma, or thrombus of the labium consists of an effusion of blood into the tissue of one labium, which, becoming clotted, forms a tumor varying in size from an egg to that of a foetal head.

It is mostly met with during pregnancy or parturition, seldom occurs spontaneously, but generally from some injury. The obstruction to the return of venous blood by the advancing head during labor, or the bruising and laceration occasioned by the passage of the head, is often sufficient to cause rupture of the veins, and as the blood cannot escape externally, it collects and forms a tumor around the seat of rupture.

In non-pregnant women a similar condition, though less extensive, may occur from severe muscular efforts, as straining at stool, carrying heavy burdens, from blows or injury to the labia, or jolting against the pommel of a saddle, slipping in getting over a stile, a kick upon the parts, etc.

Symptoms.—There is usually a sense of discomfort, occasionally as if something had burst, though not infrequently the recognition of the tumor by the sense of touch is the first evidence of its presence. Later on, throbbing and pain may be experienced. Should the tumor encroach upon the urethra, there may be difficulty in micturition. The sudden nature of the affection is generally sufficient to distinguish it from œdema or abscess of the labia, from pudendal hernia, inflammation of vulvo-vaginal glands, or other local trouble.

Course and Termination.—Where the effusion is small, it will generally disappear spontaneously, becoming absorbed, or the clot may become encysted, and remain indefinitely in the tissues. Where, however, it is of some size, especially if the accident complicate parturition, suppuration of the contents may take place and purulent infection ensue; or the sac may burst and hæmorrhage result.

Treatment.—If the effusion be small, and the symptoms slight, it will be well to apply cooling and soothing lotions and keep the patient quiet, with the hope of absorption taking place. When it is evident that suppuration is about to occur, and the swelling is very painful, it is better to foment or poultice it so as to encourage suppuration, an opening being made as soon as deemed expedient. Where the effusion is very great, so as to interfere with parturition, incision of the tumor may be requisite to complete delivery, the clot being turned out and pressure or some styptic solution applied to arrest any further hæmorrhage. Should spontaneous rupture take place, it may be necessary to enlarge the opening, turn out the clot, and plug the cavity with lint steeped in liq. ferri perchlor., as just indicated, a vaginal tampon being inserted in either case if found to be requisite, so as to ensure pressure. Where an enormous collection of blood shows no signs of becoming absorbed, and causes much discomfort or inconvenience to the patient, even though no symptoms of suppuration show themselves, it may be well to evacuate the clot by incising the sac. A bistoury is passed through the skin, on the inner face of the tumor, and allowed to cut its way out, the opening being sufficiently free to admit of the clot being turned out by the finger.

If no hæmorrhage ensue, it will be unnecessary to do more than wash the sac out with some antiseptic fluid. Only in the event of hæmorrhage should the sac be stuffed with lint or cotton, or any iron or other styptic employed. Pressure will often prove sufficient.

Fatty and fibro-cellular tumors of the vulva have been observed but rarely. In one instance a firm lobulated tumor, weighing nearly four pounds, grew from the external generative organs, hanging down to within two inches of the knees. Its surface was fissured and nodulated, and it was found to consist of hypertrophied cellular tissue, with fat in the interstices. It had been growing for nine years. Extirpation is the only reliable method of cure.

Recurrent fibrous tumors of the vulva are occasionally met with, returning after repeated removals, and ultimately proving fatal.

Pudendal Hernia.—The labia majora are the analogues of the scrotum of the male, and the round ligaments correspond to the spermatic cords. These latter pass through the internal abdominal rings, along the inguinal canals, where they are lost in the dartoid sacs. A loop of intestine, a portion of the mesentery, or an ovary may descend down one of these canals by the side of the round ligament, and constitute an inguinal hernia, or hernia of the labia.

It may occur from violent muscular efforts, as in lifting a heavy load, coughing, sneezing, etc., or may result from blows or falls.

Symptoms.—A sense of discomfort on walking, with aching pain or a feeling of fulness, may be all that the patient complains of. On examination, a swelling in the labia, resonant on percussion, reducible by taxis or on lying down, painless, with absence of all signs of inflammation or œdema, and detection of impulse on coughing, will be sufficient to suggest the nature of the swelling.

Treatment.—Place the patient on her back, with the hips elevated. If the hernia does not return naturally, gentle taxis should be employed. If reducible, an appropriate truss must be applied to the vaginal canal, and precautions taken to prevent the descent of the intestine.

If strangulation occur, and the hernia be irreducible, an operation will be required, and should be resorted to without further delay.

Hernia of the Ovary.—Instances have been recorded where the ovary has descended, either congenitally or as a complication of an inguinal hernia, into the labium majus. It has also been found in crural and vaginal hernia, as well as in those of the infra-pubic foramen and of the great ischiatic notch.

Symptoms.—There may be pain, dragging sensation, increased on walking, sickening sensation on pressure, increase of size and tenderness at the menstrual periods, the organ then being exquisitely sensitive. Should inflammation occur, the pain is greatly intensified, suppuration may take place, and peritonitis ensue. Abscess and entire destruction of the ovary may result.

Treatment.—If reduction can be accomplished by careful taxis a truss may be adjusted. If the ovary be fixed in its abnormal position and irreducible, a concave pad may be applied to prevent injury from pressure. If the discomfort be so great that it is unbearable, excision of the ovary may be necessitated.

Hyperæsthesia of the vulva has been described by Thomas. It consists in an excessive sensibility of the nerves supplying the mucous membrane of some portion of the vulva, closely resembling the hyperæsthetic state of the remains of the hymen, which constitutes one form of vaginismus.

There is no appearance of inflammation beyond occasional spots of erythematous redness.

Symptoms.—The slightest friction excites intolerable pain and nervousness, even a cold and unexpected current of air produces discomfort, and any degree of pressure is absolutely intolerable. Sexual intercourse produces so much discomfort that the patient generally applies for relief on this account chiefly. The mental distress is out of all proportion to the suffering endured. In some instances a state bordering upon monomania is noticed, the whole thought and attention being concentrated upon this exceedingly obstinate and distressing malady.

Causes.—It is most frequent about the menopause, and occurs mostly in patients of the hysterical diathesis, or where a morbid mental condition, characterized by a tendency to depression of spirits, exists.

Locally, chronic vulvitis or irritable urethral tumors may be found, but in others no apparent cause is detected.

Treatment.—Thomas speaks of this as very unsatisfactory. He recommends sending the patient away from home, where, in addition to enjoying change of air, scene, and surroundings, she would live *absque marito*; to give general tonics, as arsenic, strychnia, qui-

nine, and iron; to relieve any local condition, such as vulvitis, or urethral vegetations; to use warm fomentations, and apply sedative lotions or ointments, consisting of opium or its salts, carbolic acid, chloroform, and iodoform. Sometimes benefit seems to result from strong solutions of alum, tannin, etc. The results of caustics and the knife are not such as to inspire confidence in them.

Fissure of the vaginal orifice not infrequently occurs in newly-married patients. It may consist in merely a cleft in the mucous membrane at the posterior commissure, or a series of radiating fissures around the vestibule may be found. Fissures at the fossa navicularis often result from slight laceration of the perineum during first labors. Any operative interference, where the vagina is small, or any undue distention, as from removal of a large fibroid from the uterus, may also give rise to fissures. In some cases they seem to be due to an altered condition of the mucous membrane, caused by inflammation, especially of a syphilitic character.

The symptoms are often very distressing, and out of all proportion to the extent of the mischief. Intercourse is generally exceedingly painful and often intolerable. The mere effect of walking seems to chafe and irritate the surface. Any vaginal discharge getting into it increases the irritation, as also the least drop of urine on micturition.

On separating the labia and slightly stretching the posterior commissure the fissure is seen, bleeding if the tension put upon the parts be at all great.

In some slight cases the application of the nitrate of silver, and lubricating the surface with oil or cold cream before intercourse, is sufficient to overcome the difficulty. In other cases it will be necessary to tear open the fissure by stretching the parts with the fingers or a speculum. In severe cases the fissure must be divided slightly, not deeply, otherwise the hæmorrhage may be troublesome. Physiological rest, a change to the seaside, the use of an astringent lotion and tonics to improve the health, will then complete the cure.

Urethritis may occur independently of, or in consequence of, extension of gonorrhœal contamination, and is often very intractable.

Symptoms.—There is generally burning pain along the urethra, constant or intermittent in character, independent of micturition, but greatly aggravated by it, with tenesmus.

The urethra is found to be unusually florid, the mucous membrane swollen and painful, acute agony being caused by the passage of a catheter.

Spasmodic contraction, causing sudden stoppage of the flow of urine during micturition, with severe forcing pain, is not infrequent.

Treatment.—If recent and mild in character, rest, aperients and salines, bland drinks, and unstimulating diet may afford relief.

If more chronic, and of an aggravated form, the application of a strong solution of nitrate of silver or of carbolic acid may be indicated. Copaiba or belladonna may be administered internally.

Prolapsus Urethræ.—Procidentia, or eversio urethræ, is occasion-

ally met with in feeble and elderly patients. It consists of prolapse of the urethral mucous membrane, with proliferation of the subjacent cellular tissue. It is sensitive to the touch, though it may be present for some time without causing active symptoms. Difficult and painful micturition are generally induced, with mucous discharge and irritation.

It will be distinguished from vascular growth by noticing that it entirely surrounds the meatus urinarius.

Treatment.—The application of the galvano-cautery bulb will often prove sufficient to destroy the vascularity, the resulting cicatrization preventing a recurrence of the difficulty. It will be necessary to induce anæsthesia before operating.

Another method is to introduce a catheter into the bladder, and apply a ligature lightly round the prolapsed portion so as to strangulate it, the catheter being left in until the slough separates.

Better still, pass a catheter, and apply the loop of the galvano-cautery wire so as to remove the prolapsed mucous membrane, leaving the catheter in for some few days.

Excision by the scalpel or curved scissors may also be resorted to, the hæmorrhage being arrested by the cautery, pressure, perchloride of iron or other styptic.

Urethral polypus seldom occurs, but still instances have been noted of small mucous polypi forming in the urethra, producing hæmorrhage on micturition or dysuria.

Treatment.—Removal by ligature or scissors, and touching the base with nitric acid, the actual cautery, or mere pressure by passing a large-sized catheter, to check hæmorrhage, will remove the difficulty.

Angioma of the urethra appears to be due to venous congestion of the vessels of the anterior half of the urethro-vaginal septum. These excrescences are formed of vessels possessing a degree of erectility, analogous to priapism in the male. They are not sensitive, as is the case with vascular tumors of the urethra.

Treatment.—This is identical with that for urethral caruncle.

Cystic dilatation of urethra occurs in rare cases. A small pouch projects from the anterior vaginal wall in which urine accumulates, setting up irritation by its decomposition, and causing much inconvenience by its involuntary discharge at other times than when micturition is being performed. In some instances it attains such a size as to project at the vulva and cause inconvenience in locomotion.

Treatment.—This is similar to that of marked cases of vesicocoele. Dissect off a small patch of the vaginal mucous membrane which covers the pouch, and bring the edges together by sutures.

Where the pouch is so large as to involve a portion of the base of the bladder, it may be necessary to remove a segment of the wall of the pouch, and close the aperture thus formed by means of sutures, in the same way as in cases of vesico urethro-vaginal fistula.

Vascular Tumors of the Urethra, irritable urethral caruncle, pseudo-angioma, vascular excrescence of the meatus urinarius, fungous

vegetation, etc., are names given by various authors to express a small growth or excrescence situated at the orifice of the urethra. It consists of numerous small vessels disposed in groups, as in the *vasa vorticosa* of the choroid, held together by a little connective tissue, and covered with a layer of pavement epithelium. Nervous filaments are also present.

They are mostly of a florid red color, soft and friable, readily breaking down when grasped with forceps, bleeding on friction, exquisitely sensitive to the touch, irregular and often lobulated on the surface, occasionally resembling a miniature cock's-comb, more or less sessile on the mucous membrane to which they are limited, generally situated on the posterior wall of the urethra, varying in size from a pin's head to that of a raspberry, and even, in exceptional instances, to that of a walnut.

In some instances, in place of a somewhat pedunculated growth, we find a general vascularity of the mucous membrane of the orifice of the urethra, extending some little distance up the canal, and generally limited to an area of not more than an eighth to a quarter of an inch of the membrane surrounding the orifice. It seems to be due to excessive development of the mucous papillæ, presenting the appearance of minute florid granulations.

In other cases the tumor is much denser in structure, less vascular, less sensitive, bulging from the posterior wall of the urethra, rendering the aperture crescentic in shape.

Causes.—Vascular excrescences are found in girls and young women as well as in those more advanced in life. They occur in married and single alike. Possibly they are more frequent in married persons about or after the climacteric period. Although no definite cause has been assigned to account for their production, there is little doubt that the irritation of gonorrhœal discharge extending to the urethra will explain their occurrence in many instances.

It has been observed frequently that women who indulge in port wine or other alcoholic stimulant in any quantity, who live generously, and whose urine is often turbid or irritating from its concentration, are specially prone to develop these vascular growths. Congestion of the urethral plexus of veins from pressure of the gravid or displaced uterus, or from over-distended bladder or rectum, may explain the occurrence of these vascular growths in some cases.

Course and Duration.—This varies with the age and other conditions. In some instances they remain small for many years, producing constant annoyance and distress. In others they develop more rapidly, and may attain such a size as to interfere materially with locomotion.

Symptoms.—Pain during, or immediately following, micturition is usually the first evidence of anything being wrong sufficient to attract the patient's attention. It is often very severe, the intensity being out of all proportion to the size of the growth. There is mostly frequent desire to micturate, with smarting pain after pass-

ing water. Pain is also produced from friction or pressure, such as occurs on walking, coitus, and even from movements during sleep, which is thus disturbed. In consequence of this the patient becomes irritable, nervous, hysterical, and often greatly depressed in spirits. In some instances her whole attention is absorbed, and she gives way to the most exaggerated fears as to her condition. In addition to dyspareunia, there is often slight hæmorrhage of a bright, florid color after coitus, which also serves to alarm the patient, and leads her to imagine that cancer or some other serious disorder is commencing. Hæmorrhage may also be produced by friction on walking, or from rubbing.

Occasionally there is a sense of weight, or aching, the pain radiating down the thighs and extending to the sacrum. There is generally some little muco-purulent discharge from the urethra.

Instances are not infrequent, however, where considerable vascularity of the urethral mucous membrane, and even growths of some size, are detected, where no symptoms whatever are complained of.

Physical Signs.—On examination, a small vascular growth, varying in size from a millet seed to that of a raspberry, is found protruding from the meatus urinarius, generally attached to the posterior wall, exquisitely sensitive to the touch, and bleeding on the slightest manipulation.

A free secretion of mucus, or muco-purulent discharge, is often found bathing the surface of these growths.

Diagnosis.—If the growth protrude externally, the diagnosis is very simple. Prolapsus urethræ, or eversion of the mucous membrane, may occasion doubt, but this is cleared up if ordinary care be taken to notice the absence of any new growth. Syphilitic warts, if they occur at the urethral orifice, may be at first mistaken for vascular growths, but in the former case similar warty growths will be found upon other parts of the vulva—they are also painless.

In some instances the vascular growth is concealed within the urethra, and may not be evident unless the orifice be distended by means of dressing-forceps or urethral dilator, when it at once becomes apparent. The symptoms have occasionally been mistaken for those of stone in the bladder. The passage of the bladder sound, and observing the precaution to inspect the orifice of the urethra, will be sufficient to guard the practitioner from this error.

Where patients complain of symptoms of vaginismus, or dyspareunia, especially if slight hæmorrhage occur after coitus, and no apparent cause for this be detected, it will be advisable to dilate the urethra and examine carefully for any vascular growths.

Prognosis.—This should in all cases be guarded. If the growth be comparatively small, single, and somewhat pediculated, its removal is simple, and there need not necessarily be any return of the disease. Where, however, there are several small, sessile, fungous granulations, surrounding the meatus, and extending some little distance up the urethra, removal of them is extremely diffi-

cult, and they are very apt to return again and again. In fact, some authors regard them as a variety of epithelioma, from their extreme liability to reproduction after incision. The nervous hyperæsthesia, reflex and sympathetic phenomena, engendered by the growth, have not only materially deteriorated the health of the patient, but are very liable to remain, even for a considerable period, after the removal of the growth. I have witnessed instances where the suffering for many consecutive months appeared to be worse even than that endured by patients the subject of uterine cancer. The constant pain, frequent desire to evacuate the contents of the bladder, broken rest, impaired appetite, from morphia employed to assuage the pain and procure sleep, together with the mental depression and nervous exhaustion, produce so serious an influence upon the economy as in many instances to suggest, and even lead to, suicide. Melancholia is by no means infrequent in severe cases as a result of the intense and intolerable suffering.

Treatment.—In simple cases, where the growth is small and pedunculated, a fine ligature may be passed round the base of the tumor, gradually tightened until it cuts through; nitric acid or a knitting-needle heated over a spirit-lamp is then applied to the base to restrain hæmorrhage and prevent renewal of the growth. This I have frequently done successfully, without resorting to the employment of an anæsthetic.

Where the growth is more sessile, limited to the posterior wall, and is very small, the application of nitric, chromic, or carbolic acid may be tried with a view to arresting the progress of the growth and destroying it.

This method is of service where patients will not consent to any more direct operation for removal, but it will often be requisite to repeat the application several times before complete destruction of the growth ensues.

It is not necessary to produce anæsthesia, provided the patient will make up her mind to endure a little pain. An ordinary wooden match, slightly pointed, with a little cotton-wool wrapped tightly round the end, is dipped into a freshly prepared saturated solution of chromic acid, or into strong, not fuming, nitric acid. Having guarded the surrounding parts by placing a dossil of cotton-wool, soaked in a strong solution of carbonate of soda, just in the vaginal orifice, the match is pressed firmly in the centre of the growth for a few seconds, the whole of the diseased surface being touched. Any excess of acid should be carefully avoided by pressing the match firmly against the neck of the bottle before applying the acid, and after its application any excess must be neutralized by the soda solution. A small pledget of cotton-wool soaked in oil is then applied to the part. A soothing lotion, such as acid. hydrocyan. dil. ℥j, spir. vini rect. ℥j, liq. morph. acet. ℥ss, aquæ rosæ ad ℥viij, should be prescribed, and ordered to be kept applied to the parts for the following few days. If the patient be very intolerant of pain, the operation had better be done at her home,

when a subcutaneous injection of morphia, or a morphia suppository, may be employed.

Carbolic acid is frequently of service in those cases where there is more a general vascularity of the meatus urinarius than a distinct outgrowth. A saturated solution, made by adding a drachm of glycerin to an ounce of the crystallized acid, and slightly warming it, should be used. It may be applied with a match as in the previous case, any excess being neutralized with olive oil. The application will need to be repeated once a week for some few weeks. The relief afforded is often very great. The acid mummifies the surface, rendering it insensible to the passage of the urine, and seldom causes much inconvenience at the time.

Liq. plumbi subacet. frequently applied, has been spoken favorably of, as likely to cause shrivelling of the granulations.

Nitrate of silver causes much pain on application, and is not sufficiently powerful to destroy the growth; in many cases seeming to set up increased irritation and development. It should not be resorted to.

Actual Cautery.—A knitting-needle or small bulb cautery, heated to redness over a spirit-lamp flame; Bruce's gas-cautery; Paquelin's cautery; or the galvano-cautery wire or bulb, prove very efficient means of removing these growths, or of arresting the hæmorrhage after excision. The latter forms should be employed, when possible, as being more reliable. Owing to the extreme sensitiveness of the structure and the natural dread of being burnt, it is hardly likely that the patient will remain voluntarily passive during the operation. Anæsthesia should therefore be resorted to.

Paquelin's cautery, as recently introduced, is a most efficacious method of removing vascular growths. The instrument itself is very portable and easily got ready for use. The vapor of petroleum being driven through the handle to the tip of the platina stem, which has been first gently heated, the bulb becomes incandescent, and may be kept so as long as the vapor is supplied. It destroys the tissues rapidly and effectively, and as the amount of radiation of the heat is slight, the neighboring tissues are far less liable to injury than where the actual cautery is employed.

The great advantage of this method over any cutting operation is that the risk of hæmorrhage is almost nil, and that the deeper tissues can be so thoroughly destroyed as to lessen materially the risk of the growth recurring.

When the granulations extend some little distance up the urethra, this canal must be dilated by means of Bryant's urethral speculum dilator of ivory (Fig. 129), or other appropriate instrument, so as to expose fully the extent of the growth, facilitate operation, and protect the anterior wall of the urethra.

The growths may then be dealt with as deemed advisable, either cut off with scissors, scraped off by the curette, or removed by the cautery.

Where a very granular and irritable condition of the urethral canal extends some distance up, either independently of any vascu-

lar growth, or subsequently to their removal, it often produces severe smarting pain on micturition, and other symptoms. A couple of hair-pins, bent midway at right angles, answer capitally as retractors to expose the canal of the urethra.

The application of strong carbolic acid is here of much service, and may be applied as before directed.

A solution of nitrate of silver, ʒj ad ʒj aquam, is also very efficacious.

But where other means fail, the growth being very persistent, it is better to dilate the urethra and apply the actual cautery. The pressure of a full-sized catheter retained in the bladder is often of much service subsequently.

If there be much thickening of tissue and great vascularity of the posterior wall of the urethra, the plan of puncturing the base so as to destroy the feeding vessels, either by means of a red-hot knitting-needle, the fine point of Bruce's gas-cautery, or that of Paquelin's, will be found most applicable. The needle, when incandescent, should be made to penetrate deeply, parallel with the urethra, but not necessarily involving the mucous membrane of the urethra itself. If this latter be left intact, a great advantage will be gained in that the urine will not have to pass over a raw, exposed surface and so keep up constant irritation. The destruction of the deep tissues effectually cuts off the supply of blood to the surface, and the growth withers rapidly.

Where the growth is large, projecting from the surface, sessile or attached by a broad base,

it will be better at once to decide upon an operation for its entire removal. This should never be done hurriedly, without preparation, single-handed, in the consulting-room, but at the patient's residence, with skilled assistance. Owing to the free distribution of sentient nerves to this region, it is almost the last part in which the reflex irritability is suspended. Anæsthesia will therefore need to be profound, the patient being brought to the point of narcosis. This having been effected, the patient is placed on her back in the lithotomy position, with the knees well apart, opposite a good light.

The labia being separated by an assistant, the tumor is seized by a small pair of ring forceps, similar in construction to those employed in operations for hæmorrhoids, or by toothed forceps, or by a tenaculum passed under the base and drawn well forwards. The tumor is then excised by curved scissors or a scalpel, care being

FIG. 129.



Bryant's Urethral Speculum Dilator (half size).

FIG. 130.



Paquelin's Thermo-Cautery.

taken to cut well beyond the base of the tumor. Free hæmorrhage generally occurs. If this can be arrested by pressure and cold, the edges may be brought together by sutures passed deeply, so as to approximate the cut surfaces with a view to obtaining healing by the first intention. The site of the caruncle is thus covered with healthy tissue, and the chances of its return are greatly lessened.

A catheter may either be left in the bladder, or the urine drawn off every eight hours for the first day or two; the strictest cleanliness being enjoined. The advantages of this method are that no raw surface is left to granulate up and be constantly irritated by the passage of urine and other discharges. There is also less fear of contraction of the urethral orifice occurring subsequently, or of any septic mischief resulting.

Not infrequently, however, where the incision has been deep, the hæmorrhage is so free that it is necessary to arrest it promptly by means of the actual cautery, Paquelin's or the galvano-cautery always being used if possible. Nitric acid may be employed to arrest the hæmorrhage in some cases, but is not nearly as efficient in its action as the cautery, and generally runs down over the surrounding parts, causing much unnecessary injury. Perchloride of iron has also been used to arrest the hæmorrhage after operation, but cannot compare in efficiency with the actual cautery.

If slight oozing continue, this may generally be arrested by first passing an elastic catheter, applying a small pad of lint over the wound, and securing pressure by means of a T bandage.

The after-treatment will consist in strict attention to cleanliness, the employment of a soothing lotion, such as liquor plumbi subacet. $\mathfrak{z}\text{ss}$, glycerin $\mathfrak{z}\text{iss}$, aqu. rosæ ad $\mathfrak{z}\text{viiij}$.—M.; or glycer. boracis $\mathfrak{z}\text{ij}$, aquæ rosæ $\mathfrak{z}\text{vj}$.—M. The application of olive oil to the parts tends to allay the sense of burning, and also to prevent the urine irritating the surface. A saturated solution of carbonate of soda, or rather sufficient water added to the soda to make a thick creamy kind of paste, applied to the parts, often proves very soothing.

If applications, whether of caustics or cauteries, have extended up the urethral canal, it will be necessary to pass a bougie or catheter occasionally for some weeks afterwards, in order to prevent contraction of the canal.

Although medical treatment is useless for the cure of vascular excrescences of the urethra, much may be done by appropriate remedies in preventing them where there is a marked predisposition to their growth, and also in preventing their recurrence when they have been removed by operation.

Any unhealthy vaginal discharge should be attended to. The patient should be careful so to regulate her diet that the urine is free, and remains clear on cooling. Any departure from a natural condition should at once be inquired into. Strict moderation, if not abstention from alcohol, should be enjoined.

Animal food should be partaken of sparingly, unless the patient lead an active life. A milk and farinaceous diet proves far less likely to produce a secretion irritating to the urethra.

Curries, spices, acid fruits, and other such like articles, should also be avoided.

Hyperplasia, or hypertrophy of the clitoris, is more often congenital than acquired. When conjoined with hypertrophy of the nymphæ, as not infrequently happens, an appearance of hermaphroditism is simulated which may give rise to doubts as to the sex of the individual. Instances have been recorded where it has grown to a size of six or eight inches in length. The gland may be very large, and the prepuce so developed as to resemble a penis, the enlarged nymphæ assuming the appearance of a scrotum.

Most cases may be traced to a syphilitic origin, where the condition has been acquired and is not congenital.

It generally causes inconvenience from its bulk, interferes somewhat with locomotion, and impedes coition.

Occasionally it is so sensitive as to give rise to sexual excitement.

Treatment.—Where inconvenience results, amputation by means of the galvanic *écraseur* or by the knife may be resorted to.

CHAPTER XXVI.

CONGENITAL MALFORMATIONS AND DISEASES OF THE VAGINA.

Occlusion of the Vagina.

THIS may be congenital or acquired, partial or complete, the result of some congenital malformation, or of diseased action. The three periods of life at which we are most frequently consulted to remedy this defect are within a few days of the infant's birth or at the time; at puberty or shortly after; and at the time of marriage.

Subsequent to puberty, any occlusion of the vagina or of the cervix uteri, whether congenital or acquired, will prevent the exit of the menstrual secretion, and so produce a similar group of symptoms to those mentioned when speaking of imperforate hymen. It will therefore be unnecessary to repeat these under each variety of atresia, although, as the treatment varies somewhat, this will be specially indicated.

Atresia vulvæ (α , privative, $\tau\rho\eta\sigma\iota\varsigma$, perforation) is occasionally detected as a congenital condition due to mere adhesive agglutination of the two adjacent surfaces of the labia. In some instances the vaginal orifice is completely closed, in others the urethra is generally unimplicated. The nurse, in washing the child, finding that the vulval aperture is closed, calls attention to the fact, probably having first informed the mother that the child is not properly formed; the mother, being naturally distressed at this, asks our advice.

On examination, the labia are seen to be adherent as far as, but not including, the urethral orifice.

Treatment.—The mere passage of an ordinary probe anteriorly over the urethra into the vagina, and allowing the probe to tear asunder the adherent surfaces, will often be found sufficient to remedy this condition. In some instances gentle pressure with the fingers on either side will be all that is necessary.

A little oil should be applied to the parts to prevent their becoming again adherent, and the nurse instructed to wash them carefully and keep a little oil applied for the first few days.

Atresia vulvæ is sometimes acquired in early life from a mild attack of vulvitis or infantile leucorrhœa, adhesion taking place between the inflamed surfaces, which, if not remedied at the time, may give rise to difficulty later on.

Tearing the surfaces asunder by means of the fingers, probe, or handle of the scalpel, and applying a little oil, will generally be all that is requisite.

If not detected until the adherent parts have become firmly

united, it may be necessary to resort to incision, a pledget of oiled lint being then inserted to keep the raw edges separate.

Imperforate hymen occurs only as a congenital condition. The normal hymen consists of a double fold of mucous membrane forming a thin veil just within the vaginal canal, partly closing the ostium vaginae. It may be more or less crescentic in form, the concavity being directed upwards and forwards; circular, extending round the orifice, perforated in the centre; cribriform, pierced with several small apertures; reduced to a mere fringe, the small, rounded elevations constituting the *carunculæ myrtiformes*; or may be entirely absent. The presence of the hymen is no evidence of virginity, nor its absence proof to the contrary; this is important to remember in medico-legal cases.

When the hymen, in place of being perforated in one of the ways already mentioned, is imperforate, there may be no urgent symptoms to indicate this until shortly after puberty, and even then parents often hesitate to seek advice, thinking that their daughter is only suffering from dysmenorrhœa, and that it will all come right in time. It may be not until some years after, when marriage is contemplated, or when this has actually taken place and difficulty is experienced in a complete fulfilment of the ordinary married relations, or on account of sterility, that we are consulted.

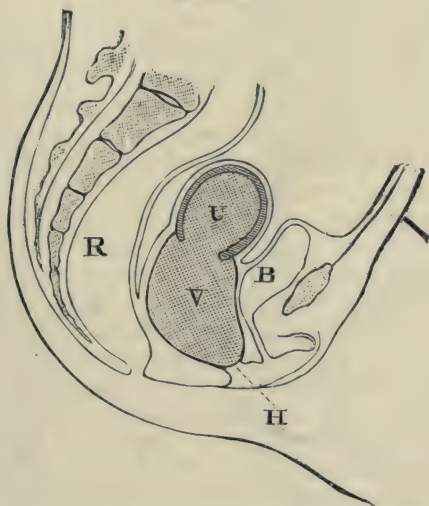
Symptoms.—Such a condition may be suspected when, puberty having arrived, all the symptoms of menstruation present themselves, excepting only the appearance of the sanguineous discharge. Pain of a forcing or bearing-down character is generally experienced at each monthly period in the lower abdomen, back and inner side of thighs, increasing in severity at times to such an extent as to constitute uterine colic, similar to the pain produced by abortion. The abdomen becomes tender, often so much so as to lead to the suspicion of peritonitis being present. The pulse increases in frequency, the temperature rises, the face becomes flushed, headache and vomiting set in, and for a time the patient is in great distress. In addition to the general symptoms of febrile disturbance, there is often marked discomfort in the pelvic region, a feeling of pressure or irritability of the bowels, and frequent or difficult micturition. After enduring for a longer or shorter time, frequently for some few days, these symptoms gradually subside, if not entirely, at least lessening in severity, until after an interval of another three or four weeks the same history is repeated, but in an exaggerated degree. The general health suffers, the appetite is impaired, nausea or occasional vomiting is experienced, the patient becomes restless, ill at ease and unable to settle to anything. Her complexion becomes muddy, her eyes yellow, the tongue furred, the bowels confined, headache persists. Symptoms of irritative hectic, septicæmia, or pyæmic fever develop themselves, and the patient's condition becomes so anxious as to necessitate medical advice being obtained.

Sometimes the chief distress seems due to the unusual distention of the uterus or vagina, or both, the enlargement being plainly

detected in the abdomen, often compressing the neck of the bladder and causing retention of urine, giving rise to symptoms of extreme prostration or collapse, weak, thready pulse, vomiting, coldness of surface, and other indications of marked constitutional disturbance.

At other times the distention has taken place so gradually that toleration of it is established, but the absence of any signs of menstruation and the gradual enlargement of the abdomen lead to the suspicion of pregnancy, and for this we are consulted. The fact of the increase in size of the abdomen having been noticed for a longer time than would be compatible with utero-gestation, and a careful inquiry into the history, will generally enable us to recognize the condition, and prevent our falling into error in our diagnosis as to the case being one of ordinary amenorrhœa simply.

FIG. 131.



Hæmatometra. Imperforate Hymen causing distention of Uterus and Vagina.
H. Hymen; V. Vagina; U. Uterus; B. Bladder; R. Rectum.

This constitutes the so-called occult or concealed menstruation. Occasionally a compensating vicarious menstruation from the bowel, bladder, nose, or skin takes place.

Physical Signs.—If the obstruction to the catamenial flow be due to imperforate hymen, this membrane will be found to be bulging at the vaginal orifice, in some cases presenting the appearance of an elastic tumor of a deep-red color. On rectal examination, we shall be able to detect distinct fluctuation anteriorly of the distended vagina. The swelling interferes considerably with the capacity of the pelvis, compressing the rectum, and in some instances rendering even the introduction of the finger difficult.

Results.—The menstrual fluid, being unable to find exit on account of the imperforate hymen, gradually accumulates behind this, until the vagina becomes full. This passage gradually be-

comes distended until no more fluid can be received. The cavity of the uterus then dilates, the cervix becoming involved, and finally the Fallopian tubes become distended.

A certain amount of transudation of the more fluid part of the contents, under the concentric compression to which it is subjected, may take place through the expanded uterine walls. But what is more certain still, a considerable portion of the fluid part of the blood is reabsorbed during the intermenstrual intervals. As the distention increases, the Fallopian tubes become involved, and some of the fluid may be forced through the fimbriated extremities into the peritoneal cavity. This accident is very likely to occur immediately after puncture of the hymen, owing to the contractions of the uterus suddenly excited. In some instances, the tubes, if adherent, become lacerated by the retreating uterus dragging upon them, and thus allow of effusion of blood into the peritoneal cavity. Even before any operative measures be resorted to, the distended tubes may burst from pressure—hæmatocele resulting.

The uterus may become so enormously distended, and its walls so thinned out, that at length it bursts. The distended hymen may rupture from some sudden strain, leading to spontaneous cure or a fatal issue. The constitutional effects likely to result from prolonged retention of the menstrual fluid have been already referred to.

Prognosis.—This, to the uninitiated, may appear extremely favorable; but when we state that numerous instances of death from simple puncture of the hymen, to give exit to retained menstrual fluid, have been recorded, it will, we trust, be sufficient to deter the practitioner from hastily expressing an opinion without fully considering the risk. Where the retention has been going on for several months, or even years, the vagina, uterus, and Fallopian tubes are often enormously distended. The uterus has been known to be enlarged to the size usually attained at the sixth or even the ninth month of utero-gestation, the walls being thinned, those of the Fallopian tubes also. The difficulty is, not in letting out the pent-up fluid, and so affording relief to the patient, but in preventing a fatal result ensuing in consequence of the operation.

It may be well to mention the accidents most likely to occur before describing the methods of operating. These are

1. Intra-peritoneal hæmorrhage, from reflux of blood through the Fallopian tubes, owing to spasmodic contraction of the uterus, where the retained fluid has been suddenly evacuated.

2. Rupture of the Fallopian tube, in cases where adhesions occur; the thin and distended walls being unable to withstand the traction put upon them during the contraction of the uterus. The sudden withdrawal of the distending force may also exercise an injurious effect on the vitality of the tissues, and so favor rupture of the tube.

3. Owing to the admission of air, decomposition of some of the retained fluid readily occurs. This may easily give rise to inflammation of the walls of the cavity, and septic peritonitis be thus set up, or pyæmia ensue in consequence.

Even the admission of air to a cavity that has hitherto been completely shut off from atmospheric influences may be sufficient to set up inflammation of the walls. The longer the retention has been present, the more likely are the Fallopian tubes to have become distended, and the greater the risk of an operation.

Treatment.—Bearing in mind the risks of allowing air to enter the cavity, we must endeavor to evacuate the collection of blood in such a manner as will obviate as much as possible this danger.

Various methods have been proposed and tried.

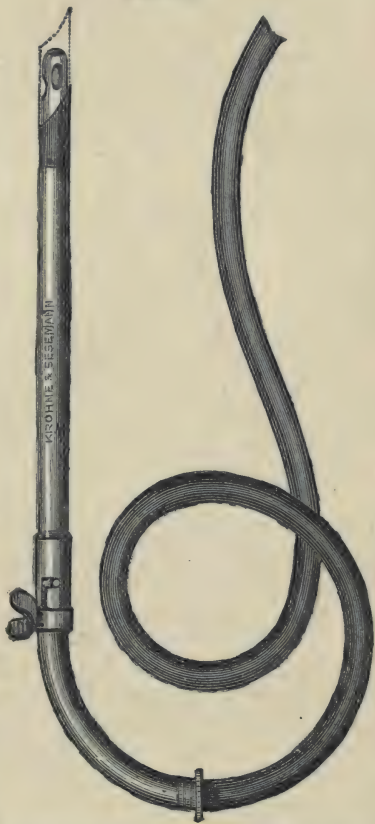
The operation should at all times be regarded as a serious one, not lightly to be undertaken without explaining to the patient herself, or to her friends, the possible dangers, and never without due preparation, the patient being kept absolutely quiet in bed for at least the first few days. Every antiseptic precaution possible should be observed. The best time to select for the operation is shortly after a menstrual epoch, when the organs concerned are in as quiescent a state as possible.

If the amount of retained blood be considerable, and there is thus reason to believe that the Fallopian tubes are involved, the better plan will be to puncture the hymen with a very small trocar, to the canula of which several feet of india-rubber tubing are attached, the distal end being placed in a basin or other vessel, containing a five per cent. solution of carbolic acid, on the floor near the bed.

The tube itself may first be filled with some of the fluid, so as to avoid even the possibility of any air gaining access to the cavity. This favors the exit of the retained fluid, acting as a siphon. The tube should not be larger than one of Southey's drainage-trocars, but to prevent the possibility of air gaining access, an instrument specially constructed on the same principle as Spencer Wells's tapping-trocar should be employed (Fig. 132).

By this method the fluid is allowed to drain away very gradually. The aspirator-trocar has been employed to drain off a little of the fluid at a time, with a similar object.

FIG. 132.



Spencer Wells's Improved Tapping-Trocar,
with Fitch's Improved Dome-shaped End.

The evacuation of the fluid being spread over a considerable time, allows the parts to return in the most gradual manner to their proper size, so preventing undue and irregular action of the uterine fibres.

Dr. Graily Hewitt adopts the plan of making an oblique opening in the obstructing membrane, giving it a valvular character, so as to allow of the escape of a very minute quantity of fluid, almost *guttatim*. If the opening become closed, a second and similar opening may be made the following day, or two or three days later. If by any chance air enter and the fluid become decomposed, it would be safer at once to make a free opening.

Character of the retained blood.—It is generally dark-colored, more like treacle, of glutinous consistence, inodorous, free from clots. It is deficient in fibrin, contains mucus, and often cholesterin scales.

The quantity varies with the length of time it has been accumulating. As much as ten pounds have been collected, though this is rather an extreme amount.

The advantages of this gradual evacuation of the fluid are that it lessens the risk of sudden collapse of the distended uterus; of laceration of the Fallopian tubes, if bound down by adhesions; of expulsion of the fluid through them into the peritoneal cavity; as also the admission of air to the interior of the uterus.

Most authors agree in recommending firm but gentle support to the abdomen by the aid of a binder and carefully-adjusted pad during the whole period of evacuation of the fluid. It is questionable whether the practice of injecting water into the uterus after an operation of this kind be safe.

If, after either of the operations mentioned, any severe constitutional symptoms arise, or there is any evidence that decomposition has taken place, it will be better to make a free crucial incision in the hymen, and to syringe out the cavity very gently with some antiseptic fluid, such as tincture of iodine (ʒij ad Oj aq.), sulphurous acid (ʒij ad Oj aq.), carbolic acid (ʒij-iv ad Oj aq.), permanganate of potash (gr. x-xv ad Oj aq.). These injections will need to be repeated at frequent intervals.

Quinine and opium and other appropriate treatment must be resorted to if any constitutional symptoms arise.

Should, however, no febrile disturbance or septic mischief occur, when sufficient time has been allowed for the fluid to become evacuated and for the parts to recover themselves a little, a supplementary operation will be needed to enlarge the opening in the hymen, either by a crucial incision or by the removal of a circular piece from the centre. Carbolyzed oiled lint should then be inserted to prevent the raw edges again becoming adherent.

Puncture *per rectum* to evacuate the fluid is never justifiable where retention is due to imperforate hymen alone. Its advisability or otherwise in cases of atresia vaginæ is considered under this heading.

Another method of operating for the relief of imperforate hymen is that of making a free incision at once, and allowing the fluid to escape.

Dr. Emmet divides the hymen with a sharp-pointed bistoury, and then freely enlarges the incision with the index-finger. As soon as the collection has escaped, he washes out the vagina and the partially dilated uterus thoroughly with warm water, by means of a Davidson's syringe. A small glass vaginal plug is then introduced, and removed night and morning, for the purpose of having the vagina syringed out. He regards the washing out of the uterine cavity as the most important precaution against blood-poisoning, and next to this the insertion of the glass plug, which shuts out the parts from the action of the air.

Free incision unquestionably allows the ready exit of fluid, and so lessens the risk of its being forced through the Fallopian tubes. But should these be bound down by adhesions, the rapid contraction of the uterus might lead to laceration and escape of fluid into the peritoneal cavity.

Where the accumulation of fluid is small and of comparatively recent occurrence, a free incision may generally be made and the fluid rapidly evacuated.

Persistent Hymen.—Although as a rule this membrane is either ruptured or becomes dilated shortly after marriage, so as to allow of complete intromission, yet instances are not infrequent where, on account of the unusual thickness or toughness of the hymen, it is so resisting as effectually to preclude intercourse. This may in some cases, doubtless, be partly due to deficient virile force, or to too hasty ejaculation on the part of the husband.

Much distress and inconvenience generally result from the repeated attempts and as frequent failures, as well as from the local irritation and tenderness to which they give rise, or from the consciousness of there being some unusual formation which prevents her fulfilling her duties as a wife.

In many of these cases the function of the vagina is performed by the dilated urethra.

As a rule, the difficulty is not discovered until subsequent to marriage, unless some uterine disorder has led the patient to consult a practitioner. The hymen, though preventing intromission, does not prevent the escape of the menstrual fluid, and thus no ill effects result until marriage takes place.

The persistence of the hymen does not necessarily preclude impregnation. Numerous instances have occurred where the presence of a persistent hymen has necessitated incision at the time of parturition before the head of the child could pass.

Treatment.—The simplest plan is to make a crucial or stellate incision in the hymen with the scalpel or scissors, and prevent reunion by inserting a pledget of lint dipped in carbolized oil. The occasional passage of a tubular speculum or of bougies may be resorted to, in order to secure the full dilatation of the orifice, or the patient may be left to her natural resources, provided pain is not thereby induced.

Congenital atresia vaginæ may be due to complete or partial absence of the vagina, there being no trace of any passage, or a

mere *cul-de-sac* existing; to imperforate hymen; or to closure by means of a transverse membranous septum situated just immediately behind the hymen.

In some instances when the vagina is absent, the os uteri is found opening into the rectum or urethra. Impregnation has even occurred. The dilated urethra has often performed the function of the vagina when this latter canal is absent.

Acquired atresia vaginæ is of far more frequent occurrence than the former. It is almost invariably the result of cicatricial contraction from inflammation or injury following protracted labor, the vagina sloughing, and obliteration of the canal taking place.

It may occur from extensive burns in childhood, from injuries, from venereal ulceration, sloughing of the vagina after fevers, and may be complicated in some instances by vesical and rectal fistulæ. The application of too concentrated a solution of the perchloride of iron may cause sloughing of the vaginal mucous membrane and subsequent cicatrization. A form of adhesive or obliterative vaginitis is occasionally met with. The atresia, in some instances, is not complete, a narrow fistulous track may remain, affording an occasional relief by oozing, acting as a sort of safety-valve, by which extreme tension is relieved, though the track is liable to occlusion at times.

Treatment.—In cases of congenital atresia of the vagina, much will depend upon whether there is distinct evidence of the menstrual molimen taking place, or of uterine distention—hæmatometra—being present, as to whether we resort to operative interference.

Where no menstrual molimen occurs; where no distention of the uterus can be detected by careful examination of the hypogastrium, or by the rectum; or where evidence of defective sexual development exists, such as infantile condition of the mammæ and vulva, absence of hairs on the pudendum, etc., leading to the conclusion that the ovaries and uterus are undeveloped, absent, or quiescent; it may be well, unless under special circumstances, such as contemplated marriage, either to defer or postpone *sine die* the question of operation.

Careful exploration by means of a sound passed into the distended bladder, and one or two fingers *per rectum*, will generally enable us to determine the presence or absence of any organ corresponding to the uterus.

Where the vagina is congenitally absent and so interferes with the process of menstruation, coitus, or parturition, it will be requisite to resort to operative interference to make a passage, and to maintain this in a state of permanence.

Having taken precautions to evacuate thoroughly the contents of the rectum, timed the operation shortly after a menstrual epoch, and produced anæsthesia, the patient is secured in the lithotomy position, with her hips well over the edge of the bed. The index-finger of the left hand is then passed *per rectum*, and pressed firmly backwards. A curved sound is then passed into the bladder and

drawn up towards the pubic arch. Having ascertained, as far as possible, the amount of intervening tissue, a transverse incision is made with a scalpel in front of the anus through the skin. The finger of the right hand is then pushed in firmly but gradually, working from side to side, until a channel is made to the cervix uteri, equidistant between the rectum and urethra, the handle of the scalpel or other blunt instrument being employed to aid in tearing through the tissues, which must be torn more in a backward direction to avoid injuring the neck of the bladder. Supposing the os uteri be found to be imperforate, this may be either divided by the scalpel or punctured with a trocar.

Where much difficulty is experienced in making a passage to the cervix uteri, a considerable amount of time has elapsed, or the patient is exhausted from prolonged anæsthesia, it may be prudent to postpone perforating the os uteri until another time. The canal thus made may be stuffed with carbolized oiled lint, or a glass tube inserted and fastened in position by means of a T bandage, so as to prevent adhesion taking place. It is always prudent to make the artificial vagina at first larger than requisite, as a certain amount of contraction is sure to ensue. Where a considerable amount of accumulated menstrual blood—hæmatometra—has been previously diagnosed to exist, it is often prudent to wait for a few days until the raw surface of the artificial vagina has become somewhat callosous before giving exit to the pent-up fluid. After perforation of the cervix uteri, it is generally requisite to pass a tent or bougie to prevent closure of the orifice. The artificial vagina will need to be kept patulous for many consecutive weeks or months by means of oiled lint, the vaginal rest or dilator, or by bougies, as there is always a great tendency for the parts to contract and close again after operation.

The glass dilator at first accomplishes this object and also restrains hæmorrhage. In time, an epithelium gradually spreads over the raw surface and prevents the parts becoming again adherent. A narrow Hodge's pessary may be worn with advantage after the first few weeks.

Puncture *per rectum* has been recommended where the intervening space between the rectum and urethra is so slight as to preclude making an artificial vagina, but it is at best an imperfect operation, and experience proves that it is by no means devoid of risk. Even when successful in relieving the hæmatometra, an operation for the establishment of a vaginal canal will still be indicated. Where, however, a considerable amount of blood has accumulated in the uterus, and the septum between the rectum and vagina is so thin that the efforts to make an artificial vagina are not successful, the only alternative is to puncture *per rectum*, and keep the opening patulous until further efforts can be made to form an artificial vagina.

Puncture above the symphysis pubis has been resorted to in some instances, but is not an operation to be recommended.

Treatment of acquired atresia vaginæ, where the passage has at one

time been pervious, and where frequently some sinuous tract still remains, which will serve as a guide, consists in making a similar operation as in cases of congenital atresia. The difficulties encountered are generally less, and the risk of evacuating the pent-up fluid is also less. The same precautions will be requisite to keep the passage from closing up again.

Duplex Vagina.—The vagina in certain rare cases is found to be divided throughout its entire length by a longitudinal partition which completely separates the two halves. The uterus in these cases is also double, or the cavity of the uterus is divided to a greater or less extent.

The vaginal partition is not always complete, nor are the two canals always alike in size.

Should the partition interfere with coitus, it may be divided by blunt-pointed scissors, cutting from below upwards. The vaginal rest or dilator will serve to control hæmorrhage, or, if this be severe, the edges may be touched with some styptic, or by the actual cautery. Plugging the vagina with tampons of cotton-wool, and the application of a T bandage, will also effect the same object.

Prolapsus Vaginæ.—Although usually associated with prolapsus uteri, the former may occur as a primary condition; in some instances existing for a long time without implicating the position of the uterus, in others acting as an exciting cause of prolapsus uteri. Prolapse of the anterior wall, without coincident descent of the bladder, is seldom, if ever, witnessed, but prolapse of the posterior wall without involving the rectum is by no means infrequent.

Causes.—Pregnancy and parturition are by far the most frequent causes of prolapse. During pregnancy the vagina undergoes development. At the time of parturition it is naturally considerably distended during the passage of the fœtus. The process of involution does not always go on satisfactorily; the sphincter often remains enfeebled, the tonicity of the parts is impaired, the lower buttress of support—the perineum—is often ruptured, and in addition to these the weight of a bulky subinvolved uterus combines to produce a lax condition—prolapsus vaginæ resulting. It may occur apart from pregnancy and parturition, but is very rare. Senile atrophy of the vaginal walls and absorption of the surrounding adipose tissue may occasion prolapse. It is often observed in elderly patients who have borne many children.

Any violent straining efforts in patients where the vagina is lax and voluminous may serve as an exciting cause of prolapse of the vagina.

Cystocele vaginalis, or vesico-vaginal hernia, consists in an inversion of the anterior wall of the vagina, with the bladder, the two surfaces being closely adherent to each other. A pouch is thus formed which becomes filled with urine. This latter not being evacuated when micturition takes place, undergoes decomposition and gives rise to cystitis or vesical catarrh. Frequent micturition, with tenesmus, and the discharge of urine mixed with ropy mucus, occur. If the uterine sound be passed *per urethram*, the point

directed downwards may be felt protruding in the pouch, thus confirming the diagnosis of cystocele.

Rectocele vaginalis, or recto-vaginal hernia, consists in an inversion of the posterior wall of the vagina, a pouch of the rectum being carried down with it. It is most frequently observed in cases where the perineal body has been destroyed. The bowel becomes distended by faecal accumulation, irritation with mucous discharge, tenesmus, and not unfrequently hæmorrhoids, result.

A soft, compressible, but not fluctuating, globular tumor is found projecting from the posterior vaginal wall, in which scybalæ may sometimes be detected.

Enterocoele vaginalis, or entero-vaginal hernia, occurs when the posterior vaginal *cul-de-sac* being carried down, Douglas's pouch descends with it, a loop of the small intestine prolapsing into the hernial sac between the uterus and the inverted vagina.

Should this condition complicate or occur during labor, it may become strangulated, or laceration take place and death ensue.

A knowledge that such a condition as enterocoele is possible should guard the practitioner from puncturing any vaginal tumors during labor, on the supposition that the case was one of prolapsed ovarian tumor. Careful exploration *per rectum* should always be resorted to in such a case.

Treatment of prolapsus vaginæ and vaginal hernia. Where a lax and bulging condition of the vagina generally occurs, rest in the recumbent or genu-pectoral position, the injection of large quantities of cold water, and the frequent employment of astringent lotions composed of tannin (ʒiv ad Oj), sulphate of zinc (ʒiv ad Oj), alum (ʒiv-ʒj ad Oj), or sea-bathing, may first be tried. Pessaries containing any of the astringents mentioned may be used at bedtime. Attention to the general health, regulation of the bowels, and of the evacuation of the urine, must also be insisted upon.

In cases of cystocele the treatment indicated may first be tried. Micturition should either be accomplished with the patient in the genu-pectoral position; or the patient should push up the pouch at the time, so as to ensure complete evacuation. If necessary, the catheter must be employed regularly.

Should these measures fail, it will be necessary to afford supplementary support. A barred Hodge (Fig. 133) may first be tried, astringent injections being persevered with at the same time.

A vaginal stem-pessary, affixed to a perineal band, such as Barnes's or Cutters', will often succeed when, owing to the extreme laxity of the vagina, a Hodge cannot be retained.

Globular pessaries, whether of inflated air-balls, vulcanite, or other material, were formerly much used. They are, however, to be avoided if possible, as, while they correct the prolapse, they increase the existing weakness by continued distention.

Fig. 133.



Hodge's Pessary with cross-bars.

In cases of rectocele, vaginal stem-pessaries may be tried, the bowels carefully regulated and astringents employed, the patient remaining recumbent several hours daily. But it will generally be requisite to resort to some operative procedure before effecting a complete cure.

Radical Cure.—Three separate methods have been proposed and carried out with this object.

Perinorrhaphy, the ordinary operation for ruptured perineum where this latter condition seems to be the chief cause of the prolapse.

Elytrorrhaphy, or diminishing the calibre of the vagina by removing a portion of the mucous membrane and bringing the edges of the wound together by means of sutures.

Episiorrhaphy (ἐπισείον the labium, and ράφη suture), applicable only to elderly patients where patency of the vagina is no longer necessary. The lower three-fourths of the margins of the labia majora are pared, the labia minora removed, and the vivified surfaces united by sutures.

In cases of very large rectocele, removal of a slip of the entire recto-vaginal septum and closing the wound with wire sutures has been recommended.

Diphtheritic inflammation of the vagina occurs occasionally during childbed, especially where many parturient women are congregated together, as in workhouse infirmaries and lying-in hospitals.

Wounds of the vagina may occur from accidents, the introduction of foreign bodies, from surgical operations, or, as most frequently happens, from injuries during parturition.

Profuse and continuous hæmorrhage may result from even a trivial wound, especially during pregnancy. Care should therefore be exercised in performing even the simplest operations, such as removing a small wart or opening a small abscess.

Absolute rest in the recumbent position, the application of cold, pressure, or styptics, will generally succeed in arresting the hæmorrhage. Should these means fail, a needle must be passed under the bleeding vessel and a figure-of-eight ligature applied, or a suture inserted and the wound thus closed.

Cystic tumors of the vagina are found only in exceptional instances. They contain a watery or clear glairy fluid. They are supposed to be formed by dilatation of the mucous glands.

Where pain or inconvenience results from their presence, the cyst may be laid freely open by means of a bistoury, the interior plugged or swabbed out with a solution of nitrate of silver, iodine, or carbolic acid; or the cyst may be removed entire by making an incision through the vaginal mucous membrane and dissecting it out.

Fibrous, or Sarcomatous, tumors of the vagina have been described. They are mostly polypoid in shape, and may give rise to similar symptoms to those witnessed in cases of uterine polypus.

Removal by the *écraseur* will be advisable when this can be effected.

Cancer of the vagina is rarely met with as a primary condition, though it is not at all uncommon as a secondary affection extending from the cervix uteri.

In old women we occasionally find a carcinomatous infiltration producing more or less contraction of the vagina, with roughness and induration of the walls soon followed by ulceration and offensive discharge.

Lancinating pain with difficulty in micturition may be the only symptoms complained of in the early stage.

Epithelioma more often occurs in young women, pain and hæmorrhage on coitus being the earliest symptoms. At this stage it is often mistaken for condylomata.

The peculiar friable nature of the growth, the readiness with which it bleeds on examination, the indurated base, and the fact that it is not amenable to anti-syphilitic remedies, will generally enable us to distinguish it from condylomata. The contact of the opposed surfaces of the vagina often serves to propagate the disease. In the later stages the deep tissues become infiltrated, the rectum and bladder become invaded, perforation and the formation of fistulæ results.

The course and terminations are similar to those of uterine cancer.

Treatment.—If detected sufficiently early, more especially when, as usually happens, epithelioma attacks the posterior vaginal wall in young women, it may be excised with the knife or scissors, or by the aid of the galvanic or benzoline cautery. It is seldom, however, that we are consulted sufficiently early; rapid infiltration of the neighboring cellular tissue takes place, and extirpation of the diseased tissue fails to eradicate the disease.

Where hæmorrhage is a prominent symptom, some good may be attained by the local application of strong perchloride of iron, or by the use of the curette and cautery.

Vaginitis, or Colpitis.

Vaginitis, or Colpitis, are terms applied to inflammation of the mucous membrane of the vagina.

This may be acute or chronic, simple or specific.

Acute vaginitis in children not infrequently occurs from exposure to cold, want of cleanliness, the irritation produced by ascarides migrating from the rectum to the vagina, the introduction of foreign bodies or irritating substances applied to the parts, or attempts at criminal intercourse. It frequently arises in the course of zymotic diseases, such as scarlatina, measles, or small-pox; especially in strumous subjects. In adults it may be produced by exposure to cold or wet, more particularly at a menstrual period, by sexual excesses, the employment of too hot, or too cold, or too irritating vaginal injections, the irritation of acrid uterine discharges, gonorrhœal infection, the irritation of pessaries, or as a result of parturition, especially if followed by any retention of putrefying secre-

tions. Want of cleanliness aggravates the malady. Any excess of strong applications, employed in the treatment of uterine disorders, running down on the vagina may set up the most severe inflammation.

Pathology.—The vagina in a normal condition is lined by a mucous membrane covered by pavement-epithelium, thrown into folds or rugæ, which are studded by projecting filiform papillæ, between which, according to some authors, lie numerous muciparous follicles, though the presence of these latter is still denied by many.

As with other mucous membranes when inflamed, the vagina becomes highly vascular, congested, and swollen, the natural secretion is diminished in quantity, but becomes increased again within a few days, and is then more of a muco- or sero-purulent character, in some cases being of the nature of acrid, foul-smelling pus. The discharge consists of numerous epithelial cells, pus-corpuscles, an infusorial animalcule, “the trichomanas vaginalis,” recognized by its possessing one long cilium, with mucous and occasionally blood-corpuscles.

Rapid shedding of the epithelium occurs, small ecchymoses and abrasions take place, and in some instances follicular ulcerations and diphtheritic deposits make their appearance. Entire desquamation of the epithelial lining of the vagina in the form of a cast or mould has been occasionally observed. Where the attack is very severe the submucous cellular tissue becomes involved, and a true phlegmonous inflammation is developed, which may result in abscess.

Granular vaginitis is generally the direct result of pregnancy. The affection is characterized by numerous minute elevations or granulations scattered thickly over the mucous membrane of the vagina, often extending over the cervix uteri. These are due to hypertrophy of the papillæ, or, according to others, to hypertrophy of the mucous follicles lying embedded between the rugæ of the vagina.

Symptoms.—At first there is a sense of heat or burning, with generally frequent desire to micturate, and, especially in cases due to gonorrhœal infection, smarting pain in passing water. There is shortly profuse yellowish or greenish purulent discharge, often of a very offensive odor, and occasionally so acrid as to excoriate the vulva and surrounding parts. Aching and throbbing of the vagina and perineum, with vesical tenesmus, inability to stand or walk, are often present. The parts are extremely tender, the urethra, vulva, and vulvo-vaginal glands often becoming involved by extension of the inflammation, so that digital examination or passage of the speculum causes exquisite pain.

The inflammatory process generally extends to the cervix, thence to the fundus uteri, along the Fallopian tubes, to the ovaries, and may in some instances set up cystitis or pelvic peritonitis, though this latter complication seldom occurs in the early stage of colpitis. Chronic metritis, dysmenorrhœa, and sterility are frequent results. This is well seen in many prostitutes.

Dyspareunia is generally so marked that any attempt at coitus is instinctively avoided.

Gonorrhœa in the mother at the time of parturition is very liable to produce purulent ophthalmia in the infant. The accidental application of any of the vaginal discharge to the conjunctiva of the patient herself, or of any other individual, will have a similar effect.

Physical Signs.—The vulval aperture is often tender and excoriated, the labia swollen and tense, or œdematous.

The vagina is hot and tender, bathed with a creamy, yellowish, purulent discharge. On wiping this off the mucous membrane is seen to be exceedingly vascular, often studded with small ecchymoses or abrasions. Pus may frequently be made to exude from the urethra on pressing the finger along the anterior vaginal wall from behind forwards.

In some instances the disease is, however, chiefly confined to the vaginal *cul-de-sac*, and may explain the fact how women apparently healthy transmit gonorrhœa to the male.

Prognosis.—The attack may subside in the course of a few weeks, if appropriate treatment be adopted; or it may run on into a chronic form, lasting indefinitely, assuming the appearance of ordinary vaginal leucorrhœa. Sterility is frequently a sequel of acute specific vaginitis, as previously mentioned. Inflammatory symptoms are very readily set up by even trivial operations upon the uterus in this class of patients, and should therefore not be undertaken lightly. More will be given upon this subject when speaking of latent gonorrhœa.

Diagnosis.—Attention to the symptoms already detailed cannot fail in enabling us to recognize the nature of the disease. The most perplexing question to solve will be that of whether the discharge be due to simple inflammation or to gonorrhœal contagion. This is always extremely difficult, and in many cases impossible.

In children, where any doubt exists as to a criminal assault having been made, the practitioner will do well to read the remarks made on this head under infantile leucorrhœa.

In adults, the symptoms most likely to assist us in deciding upon the case being one of gonorrhœa are the severity of the symptoms; the suddenness of the onset; the scalding on micturition; the yellow or greenish-yellow color of the discharge, which consists of ill-smelling pus; the irritating quality of this, as evidenced by its producing an attack of gonorrhœa in the male, or purulent ophthalmia, if any be applied to the conjunctiva; the occurrence of inflammation or abscess of the vulvo-vaginal glands, of buboes, or of peritonitis.

Although the evidence may appear to us convincing, there are often such intricate moral and social complications involved, so many reasons for dissimulation on the part of the patient, and so much difficulty in obtaining proof, that we should be extremely careful in expressing an opinion as to the nature of the disease. Cases will be met with where it is impossible to decide definitely

on medical grounds alone, and we should always lean to the side of charity when the question is one of chastity.

It does not necessarily follow that because the female infects the male and produces a discharge, that she is suffering from gonorrhœa. Numbers of instances are on record where a patient suffering from some form of leucorrhœa has produced a discharge in her husband, leading to the supposition that she had been unfaithful to her marriage vows.

Complications.—Those most frequently met with are buboes from inflammation of the inguinal or femoral glands, abscesses in the vulva, urethritis, cystitis, inflammation and abscess of vulvo-vaginal glands, endometritis, salpingitis (inflammation of the Fallopian tubes), ovaritis, and pelvic peritonitis.

Treatment.—Whether the case be one of acute vaginitis or gonorrhœa, the treatment is almost identical. Where the inflammation is severe at the commencement of the attack, a dose of calomel, three to six grains, or blue pill gr. v-vij, followed by a Seidlitz powder or black draught, may be administered.

The patient had better remain in bed; rest, both physical and physiological, being absolutely essential.

The employment of the warm hip-bath, two or three times during the first twenty-four hours, taking the precaution to allow the water to gain access to the vagina, or using the syringe for this purpose, will conduce much to the patient's comfort. The plan suggested by Dr. Emmet of placing the patient on her back, with the hips elevated over a bed-pan, or other appropriate arrangement, and injecting continuously into the vagina a stream of hot water, raised rapidly from blood-heat to 110° F., or to as high a degree as can be borne by the patient, at least a gallon of water being injected, and the operation repeated at brief intervals, is one that seems to be well worthy of more extended trial. The hips being elevated lessens the venous congestion, the blood becoming drawn off by gravitation; the stimulus of the hot water being then applied causes the vessels to contract still more, the mucous membrane becoming blanched in appearance, and the usual size of the vagina lessened in calibre, as after the use of a strong astringent injection.

When the hips are elevated the vagina will become fully distended by the weight of water, and kept so. The hot water then comes into contact with every portion of the mucous membrane under which the capillaries lie. Inflammation is thus cut short, and the disease arrested in its progress.

The vaginal injections may be made with decoction of poppy-heads, linseed, or bran; or with solution of borax, carbonate of soda, chloride of ammonium, permanganate of potass, chlorate of potass (3j to the pint), or a little carbolic acid, 1 in 40.

Refrigerant saline aperients should be given at stated intervals to keep up a gentle action on the bowels. To increase the flow of urine so as to lessen the density, and consequently the smarting pain on micturition, a mixture of the acetate or citrate of potash,

with the tartrate of soda, given in barley water or lemonade or linseed tea, will prove of service.

The diet should be very light and unstimulating, chiefly fluid; broths, milk and soda water, etc.; alcohol being strictly prohibited.

Should the pain be very severe, sedatives must be employed locally in the form of morphia ($\frac{1}{6}$ to $\frac{1}{2}$ gr.), morphia ($\frac{1}{6}$) and atropine ($\frac{1}{20}$), or conium (gr. j) suppositories, or a starch and laudanum (℞xx-xxx) enema.

In some cases opium administered internally will be requisite to quiet the nervous system and allay the intense suffering, or the tinctura hyoseyami may be added to the mixture in drachm doses. Hypodermic injections of morphia may also prove useful.

When the more acute symptoms have subsided the diet may be a little more generous, but still unstimulating; alcohol, in any form, being prohibited.

The injections now may be rendered slightly astringent by means of alum, sulphate of zinc, sulpho-carbolate of zinc (5j ad Oij aquam), gradually increasing the strength of them to 5j or 5ij ad Oj aquam. The acetate of lead, tannic acid (3j ad Oj), infusion of oak bark, green tea, etc., have no corresponding advantages to atone for their staining the patient's linen indelibly.

The injection of hot or warm water should be repeated at least thrice daily for some time, so as to wash away the acrid discharge, and so prevent its accumulating, and possibly setting up increased irritation. The glycerin carbolic acid, 3j-5ij ad Oj aquam, forms a useful addition to the injection.

When all febrile symptoms have disappeared, and the discharge persists, the application of a strong solution of nitrate of silver (5j-5ij ad 5j aquam), or of carbolic acid (5ij-iv ad 5j glycerin), more especially in those cases where granular vaginitis exists, will often prove of much service. The vagina should first be wiped dry from all secretion by means of a mop of cotton-wool, or any discharge removed by the injection of warm water. There are two methods of doing this effectually. One is to pour out half an ounce or so of the solution in a small porringer, then having distended the vagina by passing as large a Fergusson's speculum as the canal will tolerate, right up to the cervix uteri, swab the surface carefully over by means of a mop saturated in the solution, the speculum being gradually withdrawn, the whole surface thus being painted over.

Care must be taken, unless otherwise decided, as in cases where the vulva is implicated, not to withdraw the speculum entirely, but leave the end just within the vaginal outlet, so that the solution does not come into contact with the vulva—the junction of the skin and mucous membrane being exceedingly sensitive—otherwise considerable burning and smarting pain will result. Any excess of the fluid may be removed by means of a dry mop. Oil may then be applied by means of a mop or plug of cotton-wool saturated in oil and left in the vagina. The plug may be removed by the patient herself, if a string be previously attached to it, within eight or twelve hours, when the syringe should be employed.

The other method is to place the patient on her back, the hips being elevated; a large Fergusson's speculum is passed as before, and then half an ounce or more of the strong solution poured into the speculum so as to gravitate to the fundus vaginæ. The speculum is gradually withdrawn, so that the whole surface of the vagina is uniformly bathed with the solution. Any excess of fluid is then removed either by tilting up the speculum, just as the end is at the vaginal outlet, and allowing the solution to run off into a small porringer, or a mop of cotton-wool is employed to soak it up. A plug, saturated in oil, is then passed as before, and left in for several hours.

When nitrate of silver is used, it will be necessary to guard the patient's linen, as otherwise it will be indelibly stained.

The carbolic acid is equally efficacious in most instances, and has not the disadvantage of staining the linen.

The application of the glycer. acid. tannica, or the glyc. acid. carbol. of the B.P. is sufficiently powerful in slight cases, but not in aggravated ones.

It is well to alternate applications from time to time. Injections containing borax, permanganate or chlorate of potass, or carbolic acid, may be used one week; those containing zinc, alum, or tannic acid, another week.

Pessaries or suppositories, containing bismuth, oxide of zinc, tannic acid, acetate of lead, combined or not with atropine or morphia, may be employed at bedtime, the syringe being used in the morning to wash out the passage thoroughly.

The suppositories may be made with glycerin and isinglass, cocoa-butter, or other menstruum.

Chalybeates or other tonics should be administered when deemed requisite.

Cubebs, copaiba, and other similar remedies prove of less service in women than in men, and unless cystitis or urethritis are prominent symptoms, are not often called for.

Cicatrices of the vagina occasionally result from the healing of sloughs by granulation, whether produced by injury during parturition, or by the injudicious application of too strong caustics to the cervix uteri, any excess running down on the vaginal walls destroying the tissues.

These cicatrices may lead to atresia or stenosis of the vaginal canal, or may be present merely as crescentic bands or falciform projections into the vagina, dragging the cervix uteri out of place; or may form a dense cord, interfering with the mobility of the uterus, and causing dyspareunia or other discomfort.

Treatment.—Wounds of the vagina having a great tendency to bleed, no operation for the removal of cicatrices, however trivial it may appear, should ever be done unless the patient be in bed, and remain there for at least a few days, until any risk of hæmorrhage is past.

Division of the cicatrices, by nicking them in several places, may best be performed by means of a Simpson's metrotome, or blunt-

pointed bistoury, without the aid of a speculum, the finger serving as an efficient guide to the extent and depth of the incisions.

The insertion of the glass vaginal rest or dilator will tend to check hæmorrhage by pressure, and also to distend the vagina so as to prevent a recurrence of the cicatrices.

The glass tube will need to be worn regularly, either continuously for several hours at a time, until the incisions have healed. In any case it should be removed morning and evening, or oftener if deemed requisite, and some antiseptic vaginal injection employed to wash away all discharge, and encourage a healthy state of the surface.

Where the cicatrices are in the upper portion of the vagina, the insertion of a Hodge's pessary, carefully adjusted to meet the requirements of the case, may be resorted to after the first few days, to keep the parts on the stretch, and thus prevent any subsequent contraction.

In cases where the contraction of the vagina is not detected until the time of parturition, it will be well to wait patiently until we see what the natural efforts will accomplish in the way of dilatation, before resorting to division.

When, however, it is evident that the contraction is too great to allow of the passage of the fœtus, we must either incise the cicatrices where they are most prominent, or perform craniotomy and cephalotripsy.

Cystitis, or inflammation of the mucous coat of the bladder, is not often noticed in the female in the acute form; but occurs not infrequently as a subacute or chronic affection as a result of prolonged retention of urine, or from partial retention of urine.

Causation.—Cystitis may arise from exposure to cold or wet, from extension of inflammatory mischief to the neck of the bladder, as in cases of urethritis due to gonorrhœa, from direct irritation from calculi, or from morbid growths, as tubercle and cancer; from irritating conditions of the urine, as from cantharides, turpentine, copaiba; but especially when the urine becomes ammoniacal from retention, as occurs after parturition, in the course of puerperal fever, and in paralysis of the bladder in consequence of spinal injury or disease. The opening of an extra-uterine gestation cyst, or of a pelvic abscess, or of an adherent portion of intestine, or of an ovarian cyst into the bladder, may set up considerable irritation, inducing cystitis.

The employment of a fowl catheter, in cases where the bladder is already in an irritable condition, may be sufficient to induce an acute attack of cystitis.

Symptoms.—Irritability of the bladder, evidenced by a more or less constant inclination, or urgent desire, to pass water; difficulty in retaining the urine, a few drops being passed spasmodically, causing severe smarting or burning pain; the presence of excess of mucus or pus in the urine, are the symptoms more usually observed.

In some instances there is marked pyrexia, uneasiness or a sense

of heat over the hypogastrium, which is also tender on pressure, extending to the perineum.

In chronic cases the urine is often turbid, ammoniacal, and very offensive, containing much mucus, epithelium, and often pus and blood. When the urine is ammoniacal, the pus is converted into a gelatinous, ropy, tenacious mass, which is poured only with difficulty from one vessel into another, and may be drawn out into strings. This constitutes the condition spoken of as *vesical catarrh*. When this urine is expelled by a kind of spasmodic or convulsive effort, and is accompanied by tenesmus or straining, it is called *strangury*.

Course and Terminations.—If the cause be removed and appropriate treatment be adopted, the case may terminate favorably by resolution in a short time or remain in a chronic state almost indefinitely. The bladder at first empties itself completely, but with the frequent efforts to force out the mucus, inflammation and thickening of the neck of the bladder ensue, which interfere with the complete evacuation of the urine. A certain amount of stale urine is thus habitually retained, which increases the irritation. The walls of the bladder become thickened, ulceration of the mucous membrane occurs, infiltration of urine takes place, abscesses form, and pelvic cellulitis or peritonitis may result. The entrance of the ureters into the bladder is often obstructed, the urine can no longer flow freely, and distention of the ureters occurs, inflammation extends along them to the kidneys, and these in time become disorganized by the accumulation of urine, death ultimately resulting from uræmic poisoning, with symptoms of a typhoid character, the tongue becoming brown and the pulse feeble, the mind unconscious, and the body emitting a strongly urinous odor, with a dense, clammy sweat.

Where the condition remains in a chronic state for an almost indefinite time, the muscular coat of the bladder becomes thickened from the increased spasmodic efforts to expel the urine, and the bladder contracts upon itself, as it were, from the inability to hold urine enough to be distended to its normal dimensions. Its capacity is thus materially interfered with, and even after the inflammatory process has subsided, the bladder may be unable to retain more than an ounce or two of urine.

Treatment.—A careful perusal of the course and terminations of this troublesome affection will possibly accomplish much in the way of prevention by suggesting to the practitioner the extreme importance of not only inquiring but seeing to the proper evacuation of the contents of the bladder during and after parturition. If the least doubt exists, the hypogastrium should be at once percussed, and if necessary the catheter passed.

In the early stage, if over-distention of the bladder from prolonged retention, with consequent paralysis of the bladder, has been allowed to occur, the catheter must be passed regularly at least thrice daily, until the bladder has recovered itself, extreme caution being employed in disinfecting the catheter every time it is used.

Should cystitis, however, result, care must be taken to allow only a bland, unirritating diet, mainly composed of milk and farinaceous articles. Soda water and milk, linseed tea, barley water, and other similar demulcent fluids may be given *ad libitum*. Where pain is urgent, suppositories or small enemas of opium or belladonna at regular short intervals should be administered. Fomentations or poultices to the hypogastrium, or warm sitz baths, may be resorted to, provided the condition of the uterus does not contra-indicate their employment.

Rest in the horizontal position is essential. The application of a few leeches may occasionally be called for.

Lithia, soda, or potash water, or citrate or nitrate of potash, freely diluted, combined or not with hyoseyamus, belladonna, or opium, will generally be found of service in the early stage.

The bowels must be regulated by saline or other aperients. The patient must not be allowed to return to a nitrogenized diet until all acute inflammatory symptoms have subsided.

When the disease has become chronic, and there is more or less tendency for the urine to become ammoniacal and loaded with phosphates and mucus, nitromuriatic acid, with tincture of nuxvomica or liquor strychniæ, combined with decoction of pareira, buchu, uva ursi, or triticum repens, will generally prove of most service.

The diet must now be more liberal, but unstimulating. Alcohol, in any form, is usually contra-indicated. Opium or other sedative must be given at bedtime, and at other times if deemed requisite.

The bladder must be properly emptied every eight hours or so, if necessary by means of a catheter, carefully cleaned and disinfected after use, carbolized oil being employed to lubricate it. If the irritability has subsided, washing out the bladder, daily, by means of a double-current catheter, often proves advantageous. Warm water only should first be tried. The simplest and most efficacious method of doing this is by means of an irrigateur or siphon douche.

When the bladder has become accustomed to this, or where injection of water has been fairly tried and failed, various agents have been suggested for injecting into the cavity of the organ, allowing them to remain for some few minutes, or merely injecting and then withdrawing them. Of these, dilute nitric acid (5j-ij ad 5vj), carbolic acid (1 in 48, or 5j ad 5vj), nitrate of silver (gr. xij ad 5vj), tincture of iodine (5ss ad 5vj), or quinine (gr. vj-x ad 5vj aquam) are most likely to be of service.

A seton introduced just above the symphysis has been highly spoken of as useful in cases of chronic cystitis.

In severe and protracted cases, where there is reason to fear that ulceration of the bladder exists, or where internal remedies, washing out the bladder and injection of chemical agents, fail in affording relief, Dr. Emmet has suggested the operation of making an opening in the vesico-vaginal septum, through which the urine may escape into the vagina as rapidly as it enters the bladder. In this

way absolute rest of the organ is secured, and the inflammation will subside. The operation is in itself a simple one, and if resorted to before the disease has advanced so far as to involve the kidneys, is as free from risk as any in minor surgery.

Anæsthesia having been produced, the patient lying on her left side, the anterior wall of the vagina is fully exposed by means of a large-sized Sims's speculum. A sound, somewhat abruptly curved an inch and a half from its extremity, is introduced into the bladder, and the point firmly pressed, in the median line, against the base of the bladder, a little behind the neck. The projecting tissue on the vaginal surface is then seized with a tenaculum, and divided by a pair of scissors, directly on the point of the sound, which latter is then passed through into the vagina. One blade of a pair of scissors is passed into the bladder, and the vesico-vaginal septum divided backward in the median line.

The cautery may then be applied to the raw edges, rolled out by a tenaculum, to render them less liable to irritation from the urine. The opening must be made large at first, as a certain amount of contraction is sure to ensue, in spite of all the care that can be taken to prevent it.

To keep the artificial opening patulous, the finger must be introduced night and morning, for the first few days, then a stud or eyelet made from glass tubing, half an inch in diameter, not unlike a spool in shape, is buttoned into the slit, or a tube.

The bladder must be syringed out, either through the urethra or through this artificial opening, with large quantities of warm water daily.

The fistulous opening may be closed in the same manner as an ordinary vesico-vaginal fistula when the bladder has recovered its tone.

CHAPTER XXVII.

LACERATION OF THE PERINEUM.

Laceration of the Perineum.—The anatomy of the female perineum deserves careful study. It would occupy too much space here to enter fully upon its consideration. The student, however, would do well to consult Dr. Savage's admirable work upon the subject.¹

It will suffice for the present to state that the perineum, or perineal body, is a triangular wedge composed of fascia and areolar tissue, forming a highly elastic and dense white tendinous structure, which fills the space intervening between the backward curve of the rectum and the forward curve of the vagina, just as they emerge upon the surface. The base of the triangle is formed by

FIG. 134.

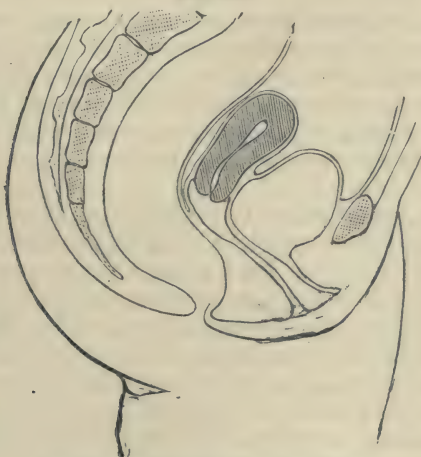


Diagram illustrating the Perineal Body.

the skin between the fourchette and anus, the tendinous aponeurosis from the fusion of the muscles which meet here giving strength and tonicity to the structure.

A reference to Fig. 134 will show at a glance the importance of this perineal body. Thomas thus defines its functions: 1. It sustains the anterior wall of the rectum, and prevents a prolapse of this, which would inevitably drag downwards the upper vaginal concavity, and with it the cervix uteri, and destroy the equilibrium of the uterus. 2. It sustains the posterior vaginal wall, and prevents a prolapse of this, which would allow of rectocele. 3. Upon

¹ The Surgery, Surgical Pathology, and Anatomy of the Female Pelvic Organs, etc., 3d edition.

the posterior vaginal wall rests the anterior, upon this the bladder, and against the bladder the uterus; all of which depend in great degree for support upon the perineal body. 4. It preserves a proper line of projection of the contents of bladder and rectum, and thus prevents the occurrence of tenesmus, a frequent cause of pelvic displacements. When therefore the perineum is lacerated as far as the sphincter ani muscle, there remains no support to the uterus, when the patient is in the erect posture, except through the connective tissue and the utero-sacral ligaments. The ischio-perineal ligaments are divided, and the transverse perinei muscles and other attachments draw the sides of the vaginal outlet apart, whereas, so long as the perineum exists in its integrity, the sides of the vagina lie in close contact, from being flattened laterally, and air is excluded. The perineal body being destroyed, air is drawn into the canal when certain positions are assumed, and subsequently escapes with a disagreeable explosive noise. This has been spoken of as *garrulitas vulvæ*, or *flatus vaginalis*. Destruction of the perineal body, more frequently than anything else, induces anterior and posterior displacements, as well as prolapsus of the uterus, by altering the shape and removing the supports of the vagina, which latter thus drags upon and displaces the uterus as a direct tractor. Thomas considers that not only does rupture of the perineum furnish one of the most fruitful sources for the absorption of septic elements, but that thousands of women suffer throughout their lives from uterine displacements, engorgements, and vesical and rectal prolapse, in consequence of injuries inflicted upon it during the parturient act.

Causation.—As prevention is better even than cure, it will be well to enumerate the conditions likely to eventuate in laceration of the perineum. Goodell thus sums them up. 1. Rigidity, dryness, and congestion of the soft parts, as in first labors. 2. Absolute or relative disproportion between the size of the foetal head, or of the shoulders, and that of the vulva. This also includes the presence of one forearm, or both, along with the shoulders. 3. Every cause, whether moral, anatomical, or physiological, that precipitates the passage of the head through the soft parts, as, for instance, violent straining efforts through great nervous excitement, a small head, a straight sacrum, or an overdose of ergot. 4. Faulty mechanism of labor, such as incomplete flexion or extension of the head; or an occiput rotating posteriorly. 5. Keeping the limbs straight and in close contact at the moment of the birth of the head. 6. Causes dependent on the physician, such as the abuse of the forceps, a faulty method of supporting the perineum, and meddling midwifery.

It would be foreign to our object to enter more at length into this question, as it belongs more strictly to obstetrics. The tonic and efficiency of the perineum may be impaired or destroyed from constitutional feebleness, prolonged over-distention, subinvolution, senile atrophy, and laceration. At present we shall confine our remarks to the latter condition.

Laceration of the perineum may be partial or complete. When the tear does not extend further than to the sphincter ani, it is spoken of as partial. This may vary from a mere superficial rupture of the fourchette, such as occurs in nearly all primiparæ, to a complete splitting up of the perineal body.

Complete laceration occurs when the sphincter ani is involved, the tear extending in severe cases some distance up the recto-vaginal septum. Incontinence of fæces and flatus result. Subinvolution of the vagina not infrequently ensues, and later on we get prolapse of the vagina with cystocele or rectocele, as well as prolapse of the uterus and rectum.

Apart from the discomfort due to the weakening of the support usually accorded by the perineum, in the way of bearing-down, dragging, aching, tenesmus, and the feeling of the pelvic organs falling through; the absence of control over the lower bowel often renders the unfortunate patient an object of disgust to her associates, and even of loathing to her husband, so that she instinctively shuns all society and is compelled to resort to almost strict seclusion.

Time for Operation.—Authorities vary considerably as to the time when the rupture should be repaired. Provided the sphincter ani or recto-vaginal septum is not seriously involved, so as to make the operation a serious and lengthy one, there can be no reasonable doubt but that the primary or immediate operation should be resorted to. The edges of the wound require no vivification, the perineum is lax and comparatively numb and insensible from the pressure and passage of the head, and in many cases the patient is already under the influence of an anæsthetic when the laceration is detected. Repair of the injury should therefore be attempted immediately after the delivery of the placenta, provided the uterus contracts and no unusual hæmorrhage occurs, or the patient is not unduly exhausted. The usual confinement to bed for ten days or a fortnight after delivery thus answers a double purpose, and the patient has not the fear of an impending operation constantly hanging over her. If success attend the effort, the patient will be saved much subsequent suffering as well as present risk from septic absorption, while failure will not in any way increase the difficulty of operating later on. The reason why the primary operation does not prove successful, is that it is often performed by those who are not accustomed to operate, the sutures are inserted too superficially, thus leaving the upper portion open, and so creating a pouch for the accumulation of putrefying materials. The operation is also often needlessly hurried, partly on account of the fear of post-partum hæmorrhage, and partly probably for fear of distressing unnecessarily the patient as well as her friends. Again, skilled assistance is often lacking, the surface of the rent is irregular and prevents exact coaptation, and the lochial discharge getting between the raw surfaces is apt to prevent union by primary intention. The immediate operation is more likely to prove successful in cases of partial than of complete laceration.

Should the wound, however, not heal, no second operation should

be attempted until the patient has fully recovered from the effects of parturition, two months or so from the date of delivery.

Primary or Immediate Operation.—As soon as the placenta is expelled, and the uterus remains firmly contracted, a nurse or assistant being instructed to maintain pressure upon the organ to prevent any risk of post-partum hæmorrhage, the external parts are carefully sponged, and if the sanguineous discharge be at all free, a cup-shaped sponge may be passed up the vagina. Placing the patient in the dorsal position, with the knees well drawn up and the hips close to the edge of the bed, opposite a window, so as to secure a good light if daylight be present, or with a lamp placed on a table behind, the operator, seated on a low chair or stool, first approximates the torn surfaces so as to see where to insert the sutures. Any ragged portions may be snipped off, and if the surface bleed freely, the parts should be sponged with cold water to check the hæmorrhage. With a curved, long-handled perineum needle, or a sharply-curved needle held in a needle-holder, and armed with stout silver wire, the operator then inserts the point about half an inch or so from the margin, a little below the lower angle or fork of the wound, carrying the needle in the recto-vaginal septum, so that the wire remains buried within this, and bringing out the point on a corresponding level with the insertion. Three or more sutures are passed, according to the extent of the laceration, each one except the lowest one or two being made to emerge on the mucous membrane of the vagina, very near the edge of the raw surface. (See Fig. 135.) Having passed as many as requisite, the sponge which was previously passed into the vagina is now withdrawn, the raw surfaces approximated, and the sutures twisted, beginning with the lowest one first. The ends of the sutures should be left about two inches long, then twisted together and secured by a small piece of india-rubber tubing, or gutta-percha warmed in hot water and moulded over the extremity, to prevent it chafing the parts. The urine should then be drawn off by means of a catheter, a pad placed between the knees, these latter bound together, and the patient turned on her side. It is generally recommended to pass the catheter every six or eight hours, and to keep the bowels confined by means of opium for the first seven or eight days. In cases of partial rupture these precautions are often unnecessary. There is far less risk of cystitis being set up if the patient be allowed to turn over on her knees to pass water, in place of using the catheter, and but little risk of disturbing the healing process if care be exercised. A grain of opium, in form of pill, or suppository, just after the operation, not only allays pain and quiets the nervous system, but also produces constipation. After the first twenty-four hours, however, a small enema of olive-oil may be administered and the action of the bowels solicited. A regular daily evacuation should then be encouraged, so as to prevent the bowels becoming unduly distended and to avoid discomfort. Strict cleanliness must be enjoined, the vagina being washed out twice or thrice daily with tepid water

containing a little Condyl's fluid or solution of borax, chloral, or carbolic acid. The diet must be light, avoiding as far as possible everything calculated to produce a bulky motion.

The sutures may generally be removed from the fifth to the eighth day, it being a good plan to divide the intermediate ones first so as to see how far complete union has taken place, leaving the others for another day or two if union is not perfect. The patient will need to be very careful not to attempt sitting up too soon, and on no account to commence walking about until the adhesions have had time to become consolidated.

Secondary Operation.—Where the laceration is so extensive, or from special circumstances the primary operation has not been deemed expedient, or has failed, the secondary operation will have to be performed later on. The time selected will depend upon the condition of the general health. This must be seen to, and, if necessary, tonics and aperients administered. The vagina should also be syringed out morning and evening with tepid water, to which is added a little borax or chloral, so as to remove all secretions, quiet local irritation, and get the tissues in as healthy a state as possible. Supposing the patient is not nursing her infant, the operation should be postponed until after the second menstrual epoch following delivery, whether the catamenia appear or not.

The secondary operation is a far more tedious and complicated process than the primary. Cicatrization having taken place, vivification of the lips or margins of the wound, by the process of perineorrhaphy, and their approximation by sutures, will have to be effected. It is in cases of complete laceration through the sphincter ani that the operation is most frequently needed, the simpler cases of partial rupture of the perineum being remedied by the primary operation.

The instruments needed are a pair of spring-toothed forceps, a tenaculum, an ordinary scalpel, a pair of scissors curved on the flat, artery forceps, half a dozen serres-fines, a long-handled, curved, blunt-edged perineum needle with the eye near the point, a few surgeon's needles with varying curves, a needle-holder, silver wire and catgut ligatures, half a dozen or more bits of sponge, the size of a walnut, fixed in sponge-holders, and a basin of iced water.

It is well to have three or four assistants, one to administer the anæsthetic, one on either side of the patient to keep the knees apart and put the tissues on the stretch, and either a fourth assistant or an intelligent nurse to look after the sponges and instruments.

For a few days preceding the operation, care must be taken to see that the bowels are regularly relieved by a full dose of castor-oil or other suitable aperient, so as to avoid any possibility of scybala being retained. The diet should be light, chiefly consisting of animal broths. A grain of opium may be given a few hours before the operation, both to quiet the bowels and allay undue nervous apprehension.

Operation for partial Rupture.—The distinction between partial and complete laceration of the perineum is great, inasmuch as the

operation for the former is a very simple one, having for its object the restitution of the perineal body, whereas the latter is a most difficult and tedious operation, and even in the most skilled hands is not infrequently unsuccessful, having for its main object the restoration of the power and functions of the sphincter ani.

Everything being in readiness, the patient is etherized, placed in the lithotomy position on the end of a table, facing a good light, the dress drawn well up around the waist, so as not to become soiled, the thighs protected from cold by flannel drawers, open at the back, or by a flannel petticoat folded over each knee, and a good-sized piece of sponge pressed in between the buttocks to collect the blood and prevent it running down on to the operator's knees.

Any hairs likely to interfere with the operation should be shaved off, the surface being first oiled. One assistant must stand facing the operator on each side of the table, the one on the right of the

FIG. 135.

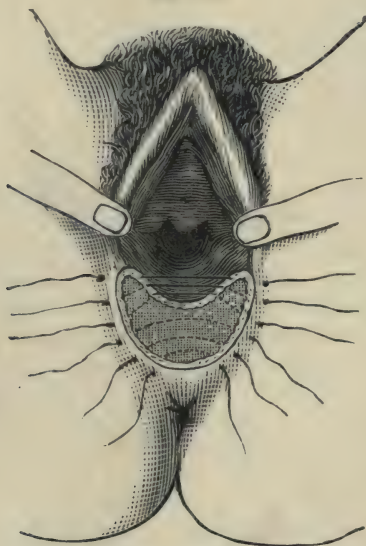


Diagram showing Surface Denuded and Sutures in Position.

patient flexing the knee well back upon the abdomen, so that the tibia is horizontal, and securing it in this position by passing his left arm over the limb and steadying the foot with the left hand, thus leaving his right hand free to retract the labium. The assistant on the left of the patient passes his right arm over the limb, well flexed, as before indicated, and retracts the labium with his right hand, keeping his left hand free to assist the operator by sponging the wound with sponges held in long-handled sponge-holders, so as not to obstruct the operator's view. Care must be taken to place the fingers of one assistant exactly opposite those of the other in retracting the labia, so as not to distort the surface to be denuded.

The operator then passing two fingers within the bowel, so as to put the surface on the stretch, commences to snip off a thin film of cicatricial tissue from the posterior vaginal wall, beginning near the anus, and carrying it up about an inch and a half up the vagina. This part of the operation may be performed by means of toothed forceps, or a tenaculum, and a scalpel, if desired, but is accomplished more expeditiously and with less hæmorrhage by the aid of scissors.

A semicircular incision is then made with a scalpel on each side, to map out the extent of the surface to be denuded, and another incision across the vagina, so as to enclose a more or less crescentic space, as in Fig. 135, which should be a little longer and a little broader than the glazed cicatrix of the original perineum.

The surface included between these incisions must now be freshened or vivified by catching up the cicatricial tissue with forceps or tenaculum, and removing by the aid of the curved scissors or scalpel a thin layer, so as to produce a raw surface, advancing from below upwards, so as to avoid the flow of blood over the surface to be removed.

There is generally pretty free oozing of venous blood, as the parts are vascular and the veins valveless. Sponging the surface with ice-cold water will, however, check this sufficiently. Any small arteries that may be seen jetting should be secured by the aid of *serres-fines* (Fig. 136), and left on until the wound is ready to be closed, or the end of the vessel may be seized with torsion-forceps and twisted.

Ligatures should be avoided if possible, as they are liable to interfere with the union by first intention.

If any undenuded surfaces are observed, they should be removed by the curved scissors.

It is better not to hurry the second stage of the operation until bleeding has stopped.

Hæmorrhage having ceased, we may now proceed to introduce the sutures. Silver wire is generally best, although some prefer the catgut sutures. The choice of an appropriate needle is important. The ordinary long-handled, sharply-curved perineum needle has generally a cutting edge, which is a disadvantage, and is also obliged to be stouter than would be otherwise necessary, in order to secure the requisite rigidity. Most operators prefer a short, straight, or slightly curved, round needle, without any cutting edge, about one and a half to two and a half inches long. This is held in the grip of a needle-holder, and is either armed with silver wire or with a double silk thread, having a good long loop, so as to draw the silver sutures into place. Whatever form of needle be employed, the point is inserted about half an inch external to the margin of the freshened surface in the left buttock, a little above the level of the anus. The index-finger of the left hand is passed into the rectum, so as to enable the operator to judge of the course

FIG. 136.



Serres-fines.

of the needle, which should be in a somewhat semicircular direction. The suture should remain imbedded in the recto-vaginal septum, neither transfixing the rectal nor vaginal wall. The point of the needle being made to emerge at a corresponding point on the right side, counterpressure with the thumb-nail may be made if requisite, to facilitate the exit of the point.

If any difficulty be experienced in passing the needle as directed, it may be drawn out at the centre and reinserted. The ends of the silver wire are lightly twisted together to keep them distinct, and then other sutures are inserted at intervals of about one-third of an inch, as indicated in Fig. 135. The lower two or three sutures should be carried so as to lie imbedded in the recto-vaginal septum, as they excite much less irritation and act less like setons than if exposed. The last two or three sutures inserted towards the apices of the triangles will naturally be uncovered on the vaginal surface. When the two sides of the raw surface are brought together, the sutures will lie much more parallel than would at first sight appear. They should be twisted from below upwards, or clamped with a perforated shot, as may be deemed expedient, but the old-fashioned quilled suture is seldom employed now.

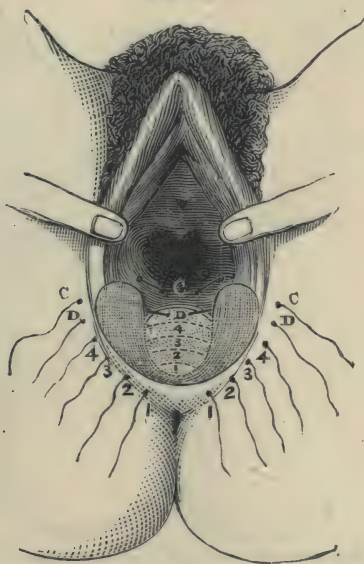
If the long-handled perineum needle be used, it is better to pass the needle first through the tissues, making the point emerge on the opposite side, and then thread the silver wire through the eye and withdraw it. All the sutures are inserted before any are fastened, and this latter step should not be taken until bleeding has almost ceased.

As in the primary operation, it is well to leave the ends about three inches long, twist them together, and secure the ends by a small piece of india-rubber tubing or gutta-percha. The subsequent management is the same as that already detailed when speaking of the primary operation, and need not be repeated here.

Emmet's operation (Fig. 137) varies slightly in the shape of the surface denuded, and in the arrangement of the sutures. The upper suture, *c c*, is passed through the labium just in line with the limit of the freshened surface. It is then made to catch up a small portion of the vaginal tissue beyond the denuded surface on the recto-vaginal wall, when it also passes to the opposite labium. Formerly, when this suture was introduced at *d* along the upper edge of the denuded surface, and the parts were then brought together, the union was seldom complete. The edges were frequently pulled apart on carelessly introducing the catheter, from movement of the limbs, or from a certain amount of dragging backward, from the weight of the posterior wall of the vagina. It was difficult also to protect the parts from urine, which would sometimes force its way in behind the flaps and prevent union. It is therefore intended that this suture shall draw a portion of the vaginal tissue sufficiently forward to protect the edges which have been approximated by the preceding suture. At the same time this suture plays even a more important part, since, by including the tissue beyond, it sustains all the traction until the denuded surfaces have had time to become firmly united.

Operation for complete Rupture.—This is at all times a difficult operation, having for its object closure of the rectal opening, restoration of the perineal body, and, most important, restoration of the sphincter ani muscle to all its powers and functions. This latter can only be effected by attaining complete union of the ends of the severed muscle. Where the sphincter ani is not only torn, but the laceration of the recto-vaginal septum extends an inch or more above the upper edge of the sphincter ani, it is generally advisable to perform two distinct operations. We must first pare the edges of the rent in the septum, and secure union if possible as far down as the anus by an operation termed colporrhaphy, leaving the operation of perineorrhaphy for a subsequent period. Where, however, from force of circumstances, it is essential to perform the

FIG. 137.



Emmet's Operation for Lacerated Perineum.

two operations at the same time, the margins of the rent in the septum must first be vivified, catgut or silkworm gut sutures employed, and the ends brought out either in the vagina or rectum, as deemed most expedient. The advantage of employing sutures made of animal tissue is that they undergo absorption, and it will therefore need no stretching of the parts to effect their removal. Colporrhaphy having been performed, the operator then proceeds with the operation of perineorrhaphy, as previously described.

Where the rent in the septum is not extensive, a single operation is often sufficient, provided care be taken to introduce the first suture as low down as the lower margin of the anus, and to pass it through the recto-vaginal septum, completely encircling the rectal rent, as indicated in Fig. 137.

The remaining sutures are passed parallel with this, the finger in

the bowel guiding the needle if necessary, so that as many of the sutures as necessary remain imbedded in the recto-vaginal septum. By this means the ends of the sphincter ani muscle are elevated and the margins of the slit in the bowel brought together.

In cases where the bowels are kept confined for a week after the operation, the insertion of a rectal tube or large-sized elastic catheter occasionally, to permit the escape of flatus, is advised. The stitches may be removed towards the end of the week, taking the same precautions as previously mentioned. Should any large scybala form and threaten the safety of the new adhesions, enemata of ox-gall or of olive oil should be administered, or they may be broken up by means of a hair-pin, handle of a small spoon or toothbrush. It is, however, quite unnecessary to keep the bowels confined.

FIG. 138.



Surface denuded in complete Perineal Rupture, and first two Sutures in position. (After THOMAS.)

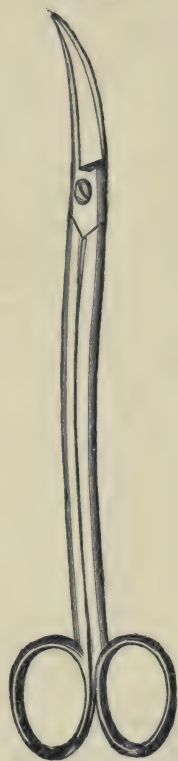
The plan of encouraging a daily evacuation by means of oil enemata has stood the test of experience, and may with safety be recommended.

Should any small fistulous opening remain in the recto-vaginal septum, an attempt to close it may be tried by touching the margins with acetum cantharidis, nitric acid, or the actual caustery followed by coaptation with serres-fines or with sutures. If the opening be large, it must be treated in the manner mentioned when speaking of recto-vaginal fistula.

It is well to guard the patient against disappointment by telling her that, although the perineum may be perfectly restored, the control over the sphincter ani may not be recovered for some little time afterwards. In some few cases it is never thoroughly regained but these form the exception, not the rule, if the operation has been properly performed.

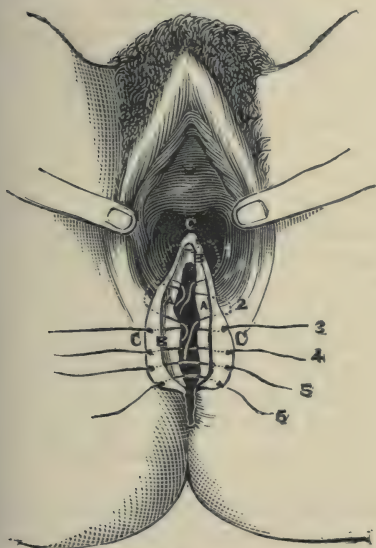
Mr. Lawson Tait has recently advocated a new method of operation, the two principles upon which it is based being that first no tissue is removed, flaps being lifted only, so that, if the operation fails, they go back to their original position, and the patient is left just as she was, without detriment to the success of a repeated effort, as is the case if edges are pared. The second principle applies to the method of application of the stitches. Hitherto these have been recommended to be applied through the thickness of the flap, and in interrupted fashion, like skin sutures. In his method

FIG. 140.



Curved sharp-pointed scissors.

FIG. 139.



Lawson Tait's Method of Operation for Repair of the Female Perineum.

they are applied in the axis of the womb, and so as to be practically continuous.

In the case represented by Fig. 139, the rent went completely through all the structures for a distance of nearly three inches upwards from the anus and posterior commissure of the vulva. He employs sharp-pointed scissors (Fig. 140) running the point of the lower blade through the skin and mucous membrane (along the line cccc) to such a depth only as will enable the operator to turn a flap backwards from each edge of the rent into the rectum. In making this incision it is important not to cut at right angles to the

vaginal surface, but at a somewhat acute angle to it, so as to bevel the flap outwards. The depth of the incision must also be so regulated as not to risk the life of the flap.

When the raw surfaces are adjusted and fastened together, it will be seen that these reverted flaps form a valve, uninterrupted by stitches, which closes from the rectum, and therefore must greatly aid the healing of the wound, by preventing the admission of fæces. To this peculiarity he attributes very largely the uniform success which he has had with this operation in a large number of cases. He uses no special needle; either a long-handled curved one or a common curved needle in a needle-holder, threaded with some of Pearsall's pure silk, which he prefers to wire or silkworm gut. The upper stitch (1, Fig. 139) is first introduced. The needle may be passed from either side into the septum, about an inch from the apex of the rent, and its entrance and exit should always be just at the line of reflexion of the flap (BB). It is passed in the thickness of the septum, and brought out within a quarter of an inch of the apex of the rent, entered again and passed similarly in the thickness of the septum, and out again opposite its original entry. If properly passed it should not, when tightened, be seen or felt either in the vagina or rectum, but should pass between the two mucous surfaces through its whole extent.

The stitches are not to be tightened, however, until they have all been placed. If necessary on account of the extent of the rent, a second stitch (2), similar to the first, should be placed lower down, but as a rule, one and the perineal stitches will be found enough. Indeed in very many cases the perineal stitches will do all that is required, and septal stitches are needed for bad cases only. The perineal stitches should never be less than three in number, and should generally be four. The third (No. 5) should be introduced just within the line of incision, on a plane with the septum and its stitches, if there be any.

All bleeding having been stopped and the wound thoroughly cleansed, the septal stitches are to be first secured, care being taken that the flaps are turned well into the rectum, and not caught in the tightened stitch; this being really the most important part of the operation. The middle perineal stitch is next to be secured and then the posterior, the same precaution with the flaps being taken. The anterior stitches are then to be secured, and the end of all cut off, leaving about half an inch of thread. If the two edges of the incision do not lie quite close together, two or three superficial stitches had better be placed to bring them close.

Before the operation, the bowels of the patient should have been thoroughly opened, and washed out with an enema. Both vagina and rectum must be washed out very carefully with carbolic water night and morning, and twenty-four hours must never be allowed to pass without the bowels being moved, small enemata of oil being administered if requisite.

The stitches should not be touched for a fortnight; twelve days at least.

CHAPTER XXVIII.

FISTULÆ OF THE FEMALE GENITAL ORGANS.

Fistulæ of the Female Genital Organs.—A fistula may be defined as an abnormal opening, the result of destruction of continuity in the wall of one of the hollow viscera, whereby communication is established with adjacent viscera or surfaces. It is generally the result of certain traumatic and morbid processes, though it may occur as a congenital malformation. The most frequent, and therefore the most important, varieties are unquestionably the vesico-vaginal and recto-vaginal fistulæ.

Other forms of urinary fistulæ are occasionally met with, such as the urethro-vaginal, the vesico-utero-vaginal, the vesico-uterine, the uretero-uterine, and the uretero-vaginal fistula. Their names sufficiently indicate their position, and we shall not attempt to enter minutely into their differentiation and treatment.

There are two other varieties of fæcal fistula besides the recto-vaginal, viz., the entero-vaginal and the recto-labial. These also it will be sufficient to mention without giving a more detailed description.

There are, in addition to these, three varieties of simple vaginal fistula, viz., the peritoneo-vaginal, the perineo-vaginal, and the blind vaginal fistula. The principle of treatment involved in all these several varieties being the same, we shall limit our observations almost entirely to the vesico-vaginal and the recto-vaginal fistulæ.

Vesico-vaginal fistula consists in a communication between the bladder and vagina. It may vary from a small hole, hardly large enough to admit an ordinary probe, to a huge aperture involving the whole base of the bladder.

Causation.—In a large majority of cases it is due to prolonged or very severe pressure of the fœtal head upon the maternal passages during the process of parturition, which results in sloughing of the compressed surface, and the formation of an artificial opening into the bladder on separation of the slough. Pressure from an ill-adjusted pessary, or from the presence of a large stone in the bladder, has been known in rare cases to produce a similar result.

Direct injury from the application of forceps, or as a result of craniotomy carelessly or unskillfully performed, may produce so much contusion or laceration as to eventuate in vesico-vaginal fistula; but there is little doubt but that in the majority of the cases the injury is caused by the prolonged or severe pressure of the fœtal head impairing the vitality of the tissues, and not to the employment of instruments, provided due care has been observed. Thomas justly remarks: "The truth with reference to this point should be well understood by every practitioner, for unless it be so

an incompetent person may shield himself from merited blame by casting censure upon a consulting physician by whose efforts the lives of both mother and child have been saved, or a skilful operator may suffer unjustly in a suit for malpractice. Speaking generally, protracted labor is productive of vesico-vaginal fistula, and the prompt use of instruments is, as a rule, preventive of them."

Ulceration or abscess is an occasional cause of fistula. Cancerous, syphilitic, or phagedenic ulcers may extend into the bladder, the latter process occurring as a sequel of continued fever in cachectic subjects.

Symptoms.—An involuntary flow of urine may occur immediately after delivery, where direct injury has produced laceration, or it may not occur for several days. In some instances a slough has separated as late as the third or fourth week, when the case was supposed to be progressing favorably. The passage of urine over tissues not accustomed to it produces a certain amount of irritation, and we get excoriation of the vulva and thighs, pruritus, and eczematous eruptions. The rugæ of the vagina often become coated with phosphatic concretions, and a most sickening, penetrating, urinous odor exhales from the patient, rendering her an object of disgust to her friends. The general health often becomes seriously impaired.

Physical Signs.—Although the symptoms of urinary fistula may be well marked, it is not always easy to discover the situation of the opening unless this be of some size. Where a small fistulous tract exists, it will sometimes elude the most careful investigation. The patient should be placed in the dorsal, left lateral, or even genu-pectoral position, a Sims's speculum passed so as to retract the posterior vaginal wall, and the labia separated by retractors so as to expose the vaginal canal thoroughly. If then the opening cannot be detected, it will be necessary to inject some milk and water into the bladder, or a diluted infusion of cochineal, madder, or indigo, and its escape into the vagina carefully watched for. A probe may then be inserted, and the nature and extent of the fistula determined. Where the opening is large, no such precautions are necessary; a sound passed *per urethram* may be felt by the finger in the vagina, or the point of the sound seen as it emerges from the bladder.

Complications.—Vulvitis and vaginitis are not infrequent. In some cases cicatricial bands form across the vagina which prevent the situation of the fistula being detected, and effectually interfere with the performance of any operation until they have been removed.

Prognosis.—Sims observes that every case is curable when the operation is practicable, provided there is no constitutional vice to interfere with the powers of union. Success is the rule, failure the exception.

Treatment.—If involuntary dribbling of urine occur within a few days of delivery, and it is clearly ascertained, by passing the catheter, that it is not due to over-distention of the bladder from

accumulation of urine, nor to incontinence of urine from paralysis of the sphincter vesicæ, the presence of a vesico-vaginal fistula should at once be suspected. An examination should be made as previously indicated, and the position of the opening determined. If this be small, a self-retaining catheter should be passed *per urethram* or an ordinary one be retained *in situ* by tapes; the patient should be enjoined to rest as much as possible in the semi-prone position, not on the abdomen entirely, lest the lochial discharge should gain entrance to the bladder and so set up cystitis; and the most scrupulous cleanliness should be observed. No operation should be attempted until the patient has recovered from the effects of parturition, and the fistula has assumed a permanent size and character. In some few cases cicatrization may occur and the opening be obliterated, but this cannot be predicted with any certainty. Touching the margins of the opening with nitric acid, blistering fluid, or other agent may be tried, a *serres-fines* being employed to contract the orifice if not of any size. The actual cautery has also been tried, a glass vaginal plug being kept in the vagina to check the flow of urine through the fistulous orifice and support the vaginal and vesical walls during the process of granulation.

Operation for Vesico-vaginal Fistula.—This should never be undertaken until the general health has been brought into as satisfactory a condition as possible, and a healthy state of the parts locally injured by the strictest attention to cleanliness. In cases of chronic cystitis, when an artificial opening has been purposely made in the base of the bladder, it is with the greatest difficulty that we can prevent the opening closing up of its own accord; in fact, it becomes necessary to place a stud in the aperture. This result is due to the raw edges of the opening being kept in a healthy condition, by the frequent employment of injection, sitz baths, etc., so as to prevent the formation of any phosphatic concretions upon the margins. From this we may learn a useful lesson for the management of fistulæ we are now considering. Copious vaginal injections of warm water should be frequently repeated. If any concretions have already formed they must be removed by the aid of a soft sponge, and the raw surface brushed over with a weak solution of nitrate of silver. Oiling the parts liable to be wetted by the urine, or the application of some simple ointment, will help to protect them from the irritation of the urine. It is advisable also to give nitro-hydrochloric acid with *nux vomica* and *calumba*, so as to insure the urine being acid, or Emmet's mixture of *R. Acid. benzoic. ʒj, sodæ biborat. ʒiiss, aquam ad ʒvj. ʒss* in water three or four times a day.

In some cases it is well to send the patient to the seaside or into the country to improve the general health before operating, the vaginal irrigation being assiduously persevered with, as the success of the operation often depends upon the parts being in as healthy a state as possible. If any cicatricial bands be present they must be divided with blunt-pointed scissors, either at the time of operation or previously. In the latter case the healing process will need to be regulated by wearing the glass vaginal plug or rest. Should

the bleeding be excessive, and not controlled by the plug, it may generally be arrested by introducing, with a pair of dressing-forceps, portions of damp cotton along the slight depression in the plug made for the urethra; then the instrument can be rotated until the outlet of the vagina has been by this means encircled by a tampon.

The bowels having been well relieved by means of medicine, and if necessary by an enema as well, the same precautions as for any other operation should be enforced. Sims's position, the patient lying on the left side, with the left arm behind the back, the thighs bent at right angles to the pelvis, the chest rotated over so that the sternum almost touches the table, is the one generally selected, though some still employ the knee-elbow and lithotomy position.

A Sims's speculum having been passed, is held by the assistant with his right hand, his left being used to elevate the right buttock. The table should always be so placed that a good light is secured. Anæsthesia is generally employed, though not invariably requisite; a grain of opium before operation may prove sufficient if there is not much cicatricial tissue to be pared away.

The operation itself may be divided into three stages.

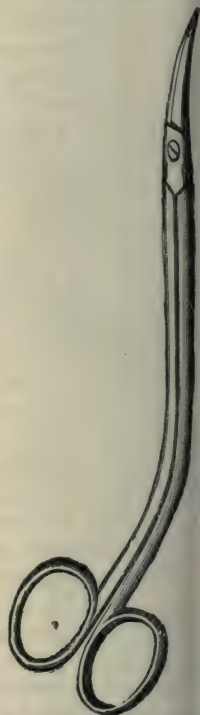
1st. Paring the edges of the fistula. 2d. Passing sutures through them. 3d. Approximating the edges and securing the sutures.

In paring the edges, it is well to begin with the part most difficult of access and manipulation. Seizing this with a tenaculum or toothed forceps (Fig. 141), or one specially constructed for these operations, as in Fig. 143, and putting it on the stretch, a strip is cut off with long-handled curved scissors (Fig. 142), or a narrow-bladed knife. A little practice will enable the operator to remove this in a single circular strip, but if he does not succeed in this, another point must be held up and the paring process continued until the margin of the opening is completely vivified, from the mucous membrane of the bladder to that of the vagina. The freshened surface should be extended as near to the mucous mem-

Fig. 141.

Spring Forceps
with Teeth.

Fig. 142.

Bozeman's Curved Uterine
Scissors.

ulum or toothed forceps (Fig. 141), or one specially constructed for these operations, as in Fig. 143, and putting it on the stretch, a strip is cut off with long-handled curved scissors (Fig. 142), or a narrow-bladed knife. A little practice will enable the operator to remove this in a single circular strip, but if he does not succeed in this, another point must be held up and the paring process continued until the margin of the opening is completely vivified, from the mucous membrane of the bladder to that of the vagina. The freshened surface should be extended as near to the mucous mem-

FIG. 143.

Vesico-vaginal
Fistula Forcep.

brane of the bladder as possible without involving it, as otherwise the hæmorrhage is apt to be very troublesome, and has before now proved fatal. Should the bleeding be at all troublesome, it may be arrested by pressing into the opening in the bladder a portion of a soft silk handkerchief and then stuffing sufficient cotton-wool into the bag so formed to secure pressure when traction is made. Another method is to pass a suture through the vagina so as to enclose a portion of the wall of the bladder, taking care to avoid including the ureters, the suture not extending more than half an inch from the median line.

The edges should always be bevelled, the incision including a third of an inch of the vaginal wall, but merely extending to the margin of the vesical aperture, not invading its mucous membrane. During this stage, frequent resort to sponging will be requisite to prevent the blood obscuring the view of the operator.

Passing the sutures is the next step. This is usually effected by slightly curved needles (without cutting edge, about three-fourths of an inch long) held in a needle-holder, but may also be accomplished by the aid of long-handled curved needles similar to those used for cleft palate (Fig. 144).

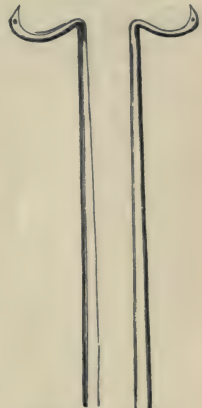
The point of the needle is inserted about a third of an inch from the edge of the incision, and brought out at the vesical surface, but not involving its mucous lining, a tenaculum being pressed round the point of exit to prevent any tearing of the tissues; the needle is then seized by suitable forceps, drawn through and

again inserted at the vesical margin, and made to emerge in the vagina.

As many stitches as may be considered requisite, at intervals of about one-sixth of an inch, are thus passed. Annealed silver wire is generally employed, either passed at once, or attached to silk threads, first passed, and the wire sutures then drawn through. The sutures are then twisted, or clamped with shot, the wire adjuster being employed in the former case to run down the wire and set it, the blunt fork acting as a fulcrum, and so preventing undue traction on the tissues.

The edges of the wound must be carefully approximated, and care exercised not to twist the sutures so tightly as to strangulate the tissues enclosed. Each suture is then cut short, about half an inch from the edge of the fistula, and bent back flat against the

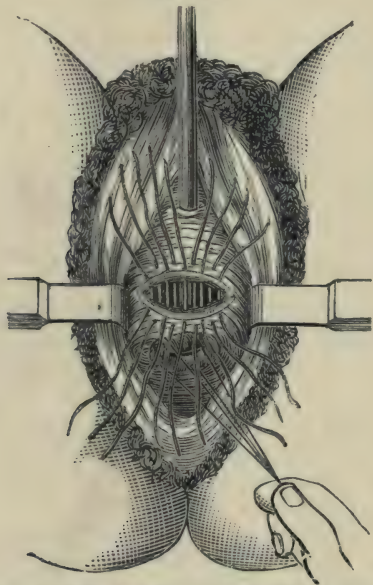
FIG. 144.

Durham's Curved
Needles.

vaginal wall so as not to injure the opposite surface. The bladder should then be syringed out with tepid water to remove all traces of blood, which might otherwise give rise to vesical tenesmus or block up the eye of the catheter. A self-retaining catheter, with a bulbous extremity and tube attached, is then passed and left in so that the urine may drain off as fast as it is secreted. It is well to have two catheters, so that one may be removed for the purpose of cleaning it, otherwise there is a tendency for the end to become encrusted with phosphates, and even blocked up. The patient should lie on her back, opium be administered to constipate the bowels, and the vagina be washed out daily, the diet being limited but nutritious.

The sutures should be left in until the eighth or tenth day. To remove them, seize the twisted end with a pair of forceps, drag on

FIG. 145.



Showing Simon's Method of Operation for Vesico-vaginal Fistula.

it gently until the edge of the loop emerges from the tissues in which it has been imbedded, then insert the point of one blade of a pair of scissors into the loop, and cut one side of it. Gentle traction, aided by a little counter-pressure with the flat end of the scissors, will then succeed in removing the suture. The same process is repeated with each consecutive suture until all are removed. If adhesion does not seem to be perfect, they may be left in for a few more days.

Simon's operation differs in many important particulars, which it will be well to mention. He employs an exaggerated lithotomy position, the breech-back position, the breech being elevated above the level of the abdomen and breast, the thighs being flexed almost

on to the abdomen if the fistula be seated high up in the vagina. He passes two threads through the cervix (see Fig. 145), so as to pull the uterus gently down. Very wide specula are employed, and the labia and sides of the vagina held back by retractors.

Instead of avoiding the mucous membrane of the bladder, he extends the incision quite through the walls of the septum to the vesical mucous membrane, and sometimes through it, extirpating all cicatricial tissue, and making a deep funnel-shaped incision, with the point in the bladder. He employs five silk sutures, using either one or two rows as considered requisite, one the "relaxing," the other the "uniting." Both rows are placed very deep, even in many cases through the vesical mucous membrane. He does not fix a catheter in, considering that in most cases the permanent retention of the catheter in the bladder does harm. The patient is allowed to pass water when and how she likes, the catheter only being used if necessary. The patient is permitted to take any position she chooses. On the eighth day she is allowed to leave her bed, even if all the stitches are not out, and in some cases still earlier. The bowels are allowed to act whenever the desire occurs, and even encouraged to do so.

As Simon had considerable success, it is only fair to conclude that many of the restrictions generally inculcated are unrequisite. The best time to operate is during the week following the menstrual period. The precaution should always be observed of sounding the bladder for a calculus, which may have been the cause of the production of a fistula during labor. It is a good plan to irrigate the vagina with a couple of gallons of hot water, at 100° F. to 110° F., before the operation, the tissues becoming blanched and shrivelled, and thus lessening the tendency to hæmorrhage. If hæmorrhage into the bladder occur, and the injection of iced water will not check it, it may be necessary to cut the stitches and secure the bleeding vessel if possible. In small fistulæ there is no need for the catheter being left in, and even in large ones, if the self-retaining catheter causes tenesmus, it should be withdrawn. Where the neck of the bladder, or the urethra, is involved, it is a good plan to make an opening in the bladder higher up, so as to allow the urine to drain off and the lower fistula to heal up. Whenever the edges of a large fistula cannot be made to come together throughout their whole extent, close one end only, and reserve the rest for another operation.

Closure of the vagina has been proposed for those cases where, from the extent of tissue destroyed, the possibility of closing the fistulous opening by means of sutures is hopeless. The vagina and bladder are thus converted into a common receptacle for urine and menstrual blood, which can be voluntarily retained, and discharged periodically through the urethra, thus removing the intolerable annoyance of an involuntary and constant discharge of urine. Two operations have been suggested. The first consists in paring the inner surfaces of the labia majora and uniting them by sutures, so as to cause their complete adhesion, and is termed *episiorrhaphy*.

The operation is a simple one, but its success is apt to be marred by a small aperture remaining patulous just under the meatus. The second consists in paring the vaginal walls, removing strips of the mucous membrane, and uniting the freshened surfaces by sutures, the bladder being kept empty by a catheter until union has taken place. Simon described it as *kolpoplekisis*, or cross obliteration.

Recto-vaginal fistula, as the name expresses, consists in a communication between the rectum and vagina. They are less commonly met with than urinary fistulæ, and give rise to less distressing symptoms, inasmuch as the fæces being generally solid, there is not that constant escape from the opening as is the case with the urine.

They are generally produced by the same causes as already mentioned in cases of vesico-vaginal fistulæ, viz., prolonged pressure, direct injury, and ulceration or abscess. The latter causes are, however, more frequent in the production of fæcal than urinary fistulæ. Stricture of the rectum, whether syphilitic or not, by producing accumulation of fæces, may lead to ulceration of the recto-vaginal septum. Syphilitic and cancerous ulceration, or an abscess, may equally cause a communication between the two passages. A partially successful operation for complete rupture of the perineum may also lead to the formation of a recto-vaginal fistula.

Symptoms.—The only evidence of the injury in many cases is the involuntary escape of offensive gas or of fluid fæces by the vagina. Although this may be comparatively slight, it is still sufficient to render the patient extremely wretched.

Physical Signs.—If the aperture be one of any size, the finger passed *per vaginam* or *rectum* will easily distinguish it. If, however, it be very small, the patient should be placed in the dorsal position, opposite a good light, Sims's speculum introduced under the symphysis so as to lift up the anterior vaginal wall, and the sides held apart by means of spatulæ. If the opening cannot be detected by sight, the rectum may be distended with water colored with cochineal, madder, or indigo, and its escape into the vagina carefully watched for.

Treatment.—Spontaneous recovery is far more likely to occur in these cases than in urinary fistulæ, and therefore some little time should be allowed to elapse before resorting to operation. If the aperture be very small, touching it with nitric acid or the actual cautery may be tried, the bowels being carefully regulated so as not to allow the rectum to become unduly distended. As a rule, if the opening does not close spontaneously within a few weeks, an operation will need to be resorted to. There are several methods employed. One is to bevel the edges from the vagina, and introduce silver sutures, as in cases of vesico-vaginal fistulæ. Another is to bevel the edges from the rectum, and introduce the sutures from the rectal side. A third is to bevel both vaginal and rectal margins, and to insert two distinct sets of sutures, silkworm gut for the rectal, to avoid the trouble of removing them, and silver sutures for the vaginal. A fourth method is to split the recto-vaginal septum at the rim of the fistula, and unite the two sets of

opposing flaps by rectal and vaginal sutures. A fifth plan, highly recommended by Goodell, is to make a shallow cut around the vaginal mouth of the fistula, about half an inch away from it, and dissect the mucous membrane up to its rim in a frill. This is next inverted and pushed into the rectum through the opening, which is now closed by rectal and vaginal stitches—the former uniting the raw surfaces of the frill, the latter the raw strip around the vaginal rim of the fistula.

Whichever plan be adopted, it is generally recommended to paralyze the sphincter ani muscle by thorough stretching with the fingers, as otherwise the constant contraction of the muscle will prevent union. Many operators still advise confining the bowels by opium for the first week or ten days, and the insertion of a rectal tube to disperse flatus, enemata of oil being administered to soften any fecal accumulation before the bowels are allowed to act.

Emmet advises, when the recto-vaginal fistula is situated directly against the sphincter, to divide the perineum and sphincter directly through to the fistula with a pair of scissors, the sides of the fistula to be freshened, and the case treated as if a laceration through the perineum had occurred, this being the only plan by which we can be certain that the edges have been thoroughly denuded.

CHAPTER XXIX.

Functional Disorders.

AMENORRHŒA—CHLOROSIS—VICARIOUS MENSTRUATION.

Amenorrhœa.—This term is used to denote the absence of menstruation (*â*, privative, $\mu\acute{\eta}\nu$, a month, and $\rho\acute{\epsilon}\omega$, I flow) at the time when naturally we should expect it to occur, that is from the age of puberty until the menopause or climacteric period, at regular intervals of about one month.

During pregnancy, and for some months following parturition, if lactation be resorted to, we have a natural physiological arrest of the catamenia, which does not therefore come within the definition.

Some authors still speak of *emansio mensium* as applicable to cases where menstruation has never appeared, and *suppressio mensium* where the function has been established, but has become arrested. A simple definition will be to include all cases of the former under the head of Primary or Primitive Amenorrhœa, and to denote the latter by the term Secondary or Accidental.

Pathology.—To understand the pathology of amenorrhœa it will be necessary to call to mind what happens during normal menstruation. Dr. Thomas thus refers to it. The eruption of ovules produces in the ovaries congestion and nervous exaltation, which continue until the process of menstruation is completed. No sooner are these organs thus affected than, through the instrumentality of the ganglionic system of nerves connecting them with the uterus, that organ sympathetically undergoes congestion likewise. The whole uterus becomes heavy, and descends perceptibly in the pelvis; its mucous membrane is swollen and turgid, and the vessels which supply it dilate under an excessive hyperæmia; then a rupture occurs and relief is obtained by hæmorrhage. For the proper performance of the function, three elements must exist in a perfect state of integrity; 1, the uterus, ovaries, and vagina must be perfect in form and vigor; 2, the blood must be in its normal state; and 3, the nervous system governing the relations between the uterus and ovaries must be unimpaired in tone. Any influence disordering one or more of these may check ovulation, the great moving cause of the function; prevent the degree of sympathetic congestion necessary for rupture of uterine vessels; or oppose the discharge of blood which has been effused.

Causation.—The causes of primary amenorrhœa are very numerous, and may be either of a constitutional or local origin.

Menstruation may be delayed for some years beyond the average time of its appearance from inherent defective vitality, unhealthy

surroundings, such as frequently met with in dressmakers and others who sit for many consecutive hours in over-crowded and ill-ventilated rooms, and seldom get healthy exercise in the open air during the daytime. Young girls, overworked and improperly fed in fashionable boarding-schools, set to practise at the piano for an hour before breakfast, in some miserably cold room without a fire, at a time when nature is putting forth grand efforts at sexual development, when maternal care and supervision is more than ever requisite, often become amenorrhœic or chlorotic, and for years afterwards suffer from the neglect of hygienic and physiological laws.

Where any phthisical tendency exists, menstruation may be delayed much beyond the usual time of its appearance, though this is not always the rule. Such patients are often very precocious, arriving at maturity earlier than usual, and not infrequently menstruating rather profusely.

Plethora occasionally has a similar effect in retarding menstruation. This is especially noticed in young girls coming up to large cities after having been brought up in the country, suddenly exchanging a poor vegetable diet for a nitrogenous one, getting little or no outdoor exercise, and working for many more consecutive hours than they have been accustomed to.

Bright's disease has been credited with producing amenorrhœa. Any cachectic condition may, indeed, prove an exciting cause, or anything calculated to produce mental depression or impair the vital powers.

An imperfectly developed uterus is the most common cause of primitive absence of the catamenia, and is a frequent cause of scanty and irregular menstruation.

Atrophy, or cystic degeneration of both ovaries, and pelvic peritonitis, are occasionally met with as local causes of amenorrhœa.

In *secondary*, or accidental amenorrhœa, where the function has only recently been established, irregularity is by no means infrequent. Young women coming up from the country to large towns often cease to menstruate for many months afterwards, so also girls on being sent to boarding-school, where they are suddenly deprived of home comforts and the freedom of home. Jealousy, and disappointment in love, are not without their influence. Sudden suppression may occur from exposure to cold during the flow, or from some powerful mental emotion or shock.

Young women newly married not infrequently cease to menstruate, and naturally conclude that they are pregnant. Conception does not really occur for some months afterwards, and thus they are very much out in their reckoning, and unless the practitioner corrects the subjective statements by the objective signs, he is likely to be very much misled. In cases of illicit intercourse, the dread of becoming pregnant, with the accompanying mental depression when a period is missed, often leads to prolonged amenorrhœa.

Cases not infrequently occur where the mere effort of reproduc-

tion has been too much, superinvolution of the uterus occurs, and amenorrhœa follows. As a natural consequence there is a cessation of all further functional activity of the generative organs; nature has made one supreme effort and expended all her forces upon the issue, after which there is a complete collapse.

In other instances a serious attack of pelvic peritonitis, ending, it may be, in severe pelvic cellulitis or pelvic abscess, exercises such a depressing effect upon the constitution as to effectually check any further manifestation of functional activity.

Repeated loss of blood, even in moderate quantities, as noticed in some patients suffering from internal hæmorrhoids, has a tendency to check the catamenial flow, and in some instances to arrest it altogether.

Other forms of vicarious menstruation will be found noticed under this heading.

In some patients, although they will tell you their periods are perfectly regular, on inquiry it will be elicited that the flow is very scanty. Such cases often cease to menstruate very early, the menopause occurring as early as twenty-three. There will generally be found to be very imperfect development of the ovaries, and an almost entire absence of any sexual feeling.

Patients travelling from India by the Cape often cease to menstruate, although the flow may have been profuse before starting.

Others become amenorrhœic on residing at the sea-side.

Mental depression, together with the confinement in prison, often acts in a similar manner.

Young servant-girls coming from a house where there are few stairs, and these wooden, in going to a house where there are several flights of stone steps, uncarpeted, often miss two or three periods.

Obliteration of the cervical canal of the uterus, following labor, or produced by the repeated application of caustics, more especially nitric acid, to the cervical canal, has been noted as an occasional cause of amenorrhœa.

Cystic disease of the ovary, if both should happen to be involved, is a frequent cause of suppression of the catamenia. The reason why it does not occur oftener is that only one ovary is generally affected.

Fevers, such as scarlet and typhoid, are not only a cause of primary, but also occasionally of secondary, amenorrhœa.

The non-appearance of the catamenia, or their gradual cessation, is not infrequently one of the earliest signs of phthisis.

Differentiation.—The difficulty that will beset the practitioner in determining the cause of any individual case of amenorrhœa will depend entirely upon his going carefully into the history and estimating at their proper value symptoms trifling in themselves, perhaps, but weighty as regards their significance when occurring in groups.

In *primitive* amenorrhœa, for instance, we shall naturally have to consider whether the function of menstruation is delayed from any

constitutional defect retarding puberty; from any serious illness occurring at or about the time of puberty, such as typhoid or scarlet fever; from defective hygienic surroundings, sudden change from country to town life, or from active to sedentary occupation; or whether the condition depends upon some abnormal state of the organs of generation, such as absence or rudimentary development of the uterus or ovaries; atrophy or diseases of the ovaries; occlusion of uterus or vagina, preventing excretion although secretion takes place. It should not be forgotten that pregnancy may occur in patients where there has never been the least sign of menstruation.

In by far the larger number of cases of secondary amenorrhœa, whether occurring in married or single women, *pregnancy* will be found to be the sufficient cause. It is quite true that suppression of the catamenia may occur, as we have seen, from a variety of other causes, and also that under certain conditions patients may apparently menstruate regularly for many months during pregnancy; yet whenever a patient consults a medical man for amenorrhœa, she being at the time in a good state of general health, and volunteering definitely the date of her last period, the practitioner should at once be on his guard. Unless other confirmatory symptoms or signs are detected, it is needless to say we should be extremely careful in giving utterance to any suspicions, in cases of single women, damaging to their fair name and fame; at the same time we must remember that our own reputation may be seriously compromised if we overlook the existence of pregnancy. Cessation of the catamenia alone should never be regarded as an unequivocal symptom of pregnancy; conception may take place without suppression occurring; suppression may depend upon many other causes; pregnancy may be simulated, the patient averring that she has not been regular for months, whereas in reality she has been perfectly so; menstruation may be simulated, by staining the linen artificially with blood, in order to avert the suspicion of pregnancy; and, as before mentioned, suppression for several months after marriage is not infrequent without pregnancy existing. All we can say is that the arrest of menstruation should suggest the possibility of pregnancy, and that in cases where any doubt exists, subjective statements should never be relied on, physical signs being alone of value.

After the first half of pregnancy has been passed, certain definite physical signs are present which, as a rule, enable us to judge accurately whether utero-gestation be present or not. It is, however, in the first few months following impregnation that we are mostly called upon to give an opinion, and it is at this period that the subject is beset with the greatest difficulties. Certain sympathetic disturbances of the digestive organs occur, such as nausea and vomiting—usually spoken of as morning sickness, since it is generally felt on first rising of a morning, usually from the second to the fourth month; constipation; tendency to fainting; change of disposition; frequent desire to micturate; pain in the breasts, or

tenderness, may all be experienced; still these again may depend upon various other causes, and cannot at all times be trusted to.

Where pregnancy exists, the mammae, about the second month, become somewhat increased in size and tender—the nipples are often turgid, the areolæ increased in area and darker, the follicles enlarged. There is a peculiar moist or glistening appearance of the areolæ. The breasts rapidly become fuller and firmer, their surface mottled with blue veins, and occasionally a little serous fluid may be squeezed from the nipple.

If a vaginal examination can be obtained, we may notice a peculiar dark violet or dusky hue of the vagina itself, stretching of the anterior *cul-de-sac*; an increased amount of thick creamy mucous secretion bathing the surface of the vagina; the cervix is often lower than normal in the vagina—softer than natural, the os being more oval and patulous than in the virgin state. The uterus is bulky, spherical in form, flattened posteriorly, bulging anteriorly. On conjoined manipulation, the increase in bulk will be very apparent. As a rule, *ballotement* cannot be employed, the embryo being too small and light to be distinctly felt before the fourth month.

Where these signs are present, we need have little fear in coming to the conclusion that the patient is pregnant. If the enlargement were due to simple congestion or hypertrophy, uterine fibroid, polypus uteri, or cancerous infiltration, there would probably be a history of menorrhagia, not of amenorrhœa.

Towards the climacteric age—the so-called change of life—when the reproductive function is about to terminate, the catamenia often become irregular. It is at this time that many whose hopes of maternity have thus far being disappointed, conceive the idea that their long wished-for desire is about to be consummated, and that pregnancy has at last commenced. It is in these cases that the practitioner is specially liable to be misled, and only by a rigid adherence to the rule, to taking nothing for granted but to prove everything, that he will be kept from error. Subjective statements are here worse than useless; objective signs can alone be relied on. Many a case of fat and flatulence, of ascitic distention of the abdomen, of ovarian tumor, and even of malignant disease of the omentum, has been diagnosed as pregnancy, and parturition confidently anticipated, where subsequently nothing but disappointment resulted.

The patient is often so certain of her being correct, that when the menstrual flow returns after some months' interval, as is not at all unusual, she straightway announces that she has had a miscarriage, and attempts either to convict her medical attendant of ignorance or incompetence, if he happens to have given a contrary opinion, or even of negligence or worse, in having induced the miscarriage by the remedies he has employed to improve her general health.

Treatment.—Amenorrhœa must not be regarded as a disease; it is only a symptom of some constitutional or, it may be, local disorder. The ovarian stimulus is often defective from the ovaries

being imperfectly nourished by unhealthy blood. When this is the case, the general health still further suffers, in that the healthy action of the ovaries has an important influence in stimulating the nervous and circulatory systems. Our efforts must be mainly directed to improving the general health, removing the apparent cause whenever practicable, at the same time alleviating the urgent symptoms. It will be useless endeavoring to induce the catamenial flow by means of oxytoxics, or even local treatment, when some grave constitutional disorder, such as phthisis, is the main cause of the defect. Unless we can improve the condition of the blood, it is hardly likely that the ovaries will be stimulated to perform their function satisfactorily, and without ovulation we cannot expect menstruation to take place.

Our great difficulty at first will be in breaking in, so to speak, upon the vicious circle surrounding the patient. If we urge her to eat, she will tell us she has no appetite; if we ask her to take exercise to promote the appetite, she will meet us with the objection that she is not strong enough; if we ask her to take tonics to increase her strength, she pleads as a reason for not doing so, that they give her headache and produce pain in the epigastrium.

In all cases of anæmia, chlorosis, and allied conditions where amenorrhœa is present as a symptom, there is almost invariably a deficiency of red globules in the blood. To remedy this, iron in some form is absolutely essential. In place of disgusting our already over-squeamish patient with some nauseous preparation—such as Griffith's mixture, the *mist. ferri co.* of the B. P., an excellent combination when freshly prepared, but totally unsuited to the cases we are considering—some of the more elegant preparations should be administered, such as the *Fer Bravais*, or dialyzed iron; the *liquor ferri dialysatus* (Squire), 10 to 30 minims; the *syrupus ferri dialysati* ʒj, the *ferri amm. cit. gr. v*; the *ferri et quiniæ citrat. gr. v*; the *syr. ferri phosph. c. quiniæ et strychniæ* ʒj (Easton's); the *syr. ferri bromid.* ʒj; the *syr. ferri iodid.* ʒj.

It is not only unnecessary but positively injurious to give large doses of iron, especially at the commencement. Any febrile tendency is thereby increased, nausea and headache with constipation induced, the appetite impaired, and such a general condition of malaise engendered as to make the patient rebel at any further attempt to take it. The better plan is to give it in combination with salines, as in the following mixture: *R̄. Liq. amm. acet. ʒiiss—ʒij*; *pot. citrat. ʒj—ʒij*; *tinct. ferri perchlor. ʒiiss—ijj*; *tinct. calumbæ, ʒiiss*; *syr. limonis, ʒiiss*; *vel. glycerin ʒj—ʒiiss*; *aq. menth. virid. ad ʒvj.*—*M.* One tablespoonful in a wineglassful of water twice or thrice daily after meals.

Dr. Barnes considers that in all extreme anæmic states the febrile irritability is liable to be aggravated by iron at first. The true indication is first to allay vascular irritability so as to prepare the system to assimilate iron. This is best done by salines, such as the freshly-prepared *liquor amm. acet.* with *pot. nitrat.*, and in almost every case the combination of some light tonic, as hop, cinchona,

or calumba. Tinct. veratr. vir. $\mathfrak{m}\text{x}$, or tinct. digitalis $\mathfrak{m}\text{x}$, with amm. carb. gr. v, often add to the efficacy of the saline. After this has been persevered with for a time, pot. iod. gr. v, with or without ammonia and bark, two or three times a day, forms a useful intermediate mixture between the saline and chalybeate.

Iron, to be of service, must be given in such a way that it can be readily assimilated, more as an element of the daily diet than as a distinct medicinal dose. It is for this reason that chalybeate waters have deservedly gained a good reputation in these particular cases. Where these are taken at their natural springs, such as Kissingen, Schwalbach, Spa, Buxton, etc., there is the double advantage of change of air and scene—no mean factor in the treatment of patients who, as long as they remain at home, are with difficulty roused into making any effort or putting forth any energy in following up any plan of treatment suggested. In whatever form iron be administered, it will be necessary to persevere steadily with it for many consecutive weeks or months, varying the preparation from time to time should the patient tire of any particular mixture.

Effervescing chalybeate lemonade can now be obtained at many of the aerated water companies, and will prove a pleasant mode of giving iron in the way suggested. Until the patient presents a more healthy appearance, has some color in her cheeks, does not suffer from palpitation and breathlessness on exertion, the *bruit-de-diable* and anæmic souffle are no longer audible, and menstruation has become properly established, we should not think of giving up the administration of iron.

Attention will need to be directed to the digestive functions. Anorexia and constipation are almost invariably present. To remedy these, drugs, diet, and exercise must be prescribed. A pill of aloes, gr. j, nux vomica gr. $\frac{1}{4}$, and myrrh gr. iij; or one of iron gr. j, aloes gr. j; ext. bellad. gr. $\frac{1}{4}$, with pil. rhei co. gr. $1\frac{3}{4}$; or the pil. of aloes, myrrh, and saffron (Rufus' pill) will promote the peristaltic action of the bowels, and so obviate the constipation.

A combination of the quinine and iron gr. v., or of dilute mineral acids $\mathfrak{m}\text{xv}$, with liq. strychniæ $\mathfrak{m}\text{iv}$, and some bitter infusion or tincture, such as chirata, calumba, quassia, or cinchona, or quinine alone, will tend to improve the appetite and also the tone of the nervous system. Arsenic often proves of much value, either as mixture or combined with reduced iron in pill.

As to exercise, it must be remembered that although regular daily exercise is of great importance in promoting the bodily health and vigor, it must be indulged in strictly in accordance with the patient's strength and power of endurance—always short of fatigue. Not only is the muscular power enfeebled from being supplied with blood so deficient in the requisite elements of nutrition, but the nervous system is quite unable to supply the requisite nerve-force to keep up any sustained exertion.

At first carriage exercise, where it can be obtained, or being rowed in a boat when the season is favorable, will assist materially

in oxygenating the blood and possibly suggesting new veins of thought. In fact mental exercise is of as great importance as bodily, and should always be considered in these cases. Gentle exercise on horseback for a limited time, rowing, walking, and other outdoor occupations, may gradually be encouraged as the patient's strength will allow, but care must be taken not to overtax the feeble powers, and so do more harm than good.

As to diet, there is often a predilection for unsuitable or indigestible things. Milk, when it can be taken, fish, poultry, game, roast mutton, and other fresh meats should be given. Vegetables and fruit should not be forgotten. A little beer or wine, such as Carlowitz, Burgundy, claret, or other light wines, may be allowed with meals where indigestion forms a prominent symptom, small quantities of liquid food at frequent intervals, not too concentrated, must be tried; thus, a little milk and water, broth, or weak beef-tea, an egg beaten up in milk or in a little sherry and water, until the patient is able to take more solid food. Beef-juce, or a little raw meat, scraped very fine and eaten as a sandwich, or anything that the patient has a special fancy for, provided it be light and easily digestible, may then be allowed.

In addition to what has been already mentioned, there are certain hygienic precautions that should never be neglected, such as the observance of early hours for retiring to rest, regularity as to meals, the choice of food, proper ventilation of rooms, especially during the long winter evenings, plenty of warm bed-clothing and a hot bottle in the depth of winter. As to clothing, no tight stays should on any account be allowed. The body should be protected by flannel from the neck to the ankles, warm flannel drawers being a *sine quâ non*, and worsted stockings.

A bath should be taken regularly every morning. If the weather be very cold, in place of sitting in a cold hip-bath, it will be better to stand in an ordinary sponge-bath, placed in front of the wash-hand stand, and the body sponged over with water varying in temperature from 50° to 65° F., depending upon whether a healthy reaction be established or not. If necessary, a little warm water may be placed in the bath at the time, to prevent any risk of getting a chill. Friction with a rough towel should then be resorted to, until the patient gets into a healthy glow.

In summer the invigorating effects of sea-bathing should be tried whenever available, but not if the sea be very rough or the weather at all chilly. The hot baths of Vichy, Éms, Carlsbad, Wiesbaden, and Baden-Baden are often of great service.

In those cases where amenorrhœa is conjoined with a plethoric state of the system, the diet must be regulated, stimulants withdrawn, exercise insisted on, and every means taken to bring the general health into a natural condition. A few leeches to the thighs, anus, or cervix uteri at the presumed menstrual period, and measures similar to those suggested in cases of sudden or acute suppression, may also be tried.

Where menstruation is suddenly suppressed, as happens occa-

sionally from exposure to wet or cold, mental shocks, etc., during a period, warm hip-baths, with or without the addition of a handful of mustard, hot foot-baths, fomentations to the lower abdomen, vaginal injections of hot water, with or without the addition of a little ammonia, the administration of some hot drink, such as a little hot brandy or gin and water, will frequently have the effect of inducing a return of the flow. A draught of liq. am. acet. with spir. æth. sulph. co. and ext. ergotæ liq. may be given at bedtime, or a Dover's powder, gr. x-xv, so as to encourage the action of the skin.

At the recurrence of the next period, should the menstrual discharge not take place, similar measures may be resorted to, a few leeches being applied to the inner side of the thighs, round the anus, or, in married women, to the cervix uteri if deemed advisable.

Stimulation of the breasts may also be tried, either by means of warm fomentations, poultices, or liniment.

An enema of turpentine (5ss ad Oj aquæ ferventis), decoction of aloes (5j ad Oj), the enema rutæ, or other stimulating injection *per rectum*, may be given with a like object.

Where disturbing emotional influences in young, delicate women at the menstrual period have caused suppression, rest and quietude, good diet, with a fair allowance of wine, and an opiate at bedtime, will often succeed in causing a return of the flow.

Constitutional or general means having been adopted without success in inducing either the appearance or return of the catamenia, we can still resort to the class of remedies termed *emmenagogues*, though how they can be expected to induce the process of ovulation is more than we can tell. Ergot has the credit of belonging to this class of remedies, but proof of its action is by no means clear.

Oil of savine in $\mathfrak{m}\mathfrak{v}$ to x doses; tinct. hellebori $\mathfrak{m}\mathfrak{xx}$ to xxx; aloes (gr. j-ij of extract, or 5j dec. aloes co.) alone or combined with ext. nucis vom. gr. $\frac{1}{4}$, and myrrh gr. j-ij; quinine gr. j-ij; strychnine gr. $\frac{1}{32}$ to $\frac{1}{24}$; cannabis indica gr. $\frac{1}{4}$ to $\frac{1}{2}$ or $\frac{1}{3}$ of the extract, or $\mathfrak{m}\mathfrak{v}$ to xv of the tincture; saffron; apiol in capsules; iodine ($\mathfrak{m}\mathfrak{x}$ to xx of the tincture); cantharides, turpentine; guaiacum, mustard—have all been recommended, but the length of the list suggests rather the obstinacy of the disorder than the efficacy of the remedies.

Menstruation has been induced by compressing the femoral arteries by means of tourniquets.

When the general health has been improved as far as practicable, and emmenagogues have been tried and failed, there are still means of applying direct stimulus to the uterus and ovaries that may be resorted to if deemed advisable.

The uterine sound may be passed daily for a few days at or about the supposed menstrual period, or once a week; a small laminaria tent may be passed up the cervix uteri, and allowed to remain in for a few hours every, or every other, week.

Cupping to the loins or sacral region may be tried. Electricity

and galvanism have also their advocates. A Faradic current may be employed, one electrode being placed over the sacrum, the other over the hypogastrium and ovarian regions alternately, or one rheophore may be placed on the cervix uteri and the other in front as before. In some cases one rheophore has been introduced up to the fundus uteri through the canal of the cervix. Intra-uterine, so-called galvanic stems, composed of alternate beads of copper and zinc, held together by a small wire rope, or of parallel pieces of these metals, or of alternate spiral coils so as to make the stem more pliable, have been strongly advocated by some authors.

Owing to the chemical change that takes place, the zinc soon becomes roughened and corroded; the stem should therefore not be left in for more than a few weeks at a time without its being withdrawn to see whether it is intact.

Should the galvanic stem appear to set up too great irritation, or its employment be deemed too hazardous, the india-rubber elastic stem, the expanding stem, or the vulcanite stem may be employed.

But if the insertion of a foreign body into the uterine canal be justifiable in endeavoring to produce what is after all but an evidence of health, too great care cannot be exercised in carefully watching the patient and withdrawing the stem on the slightest appearance of discomfort or danger. No one who is not thoroughly familiar with the details of gynecological practice should ever attempt to pursue this mode of treatment. Other means, such as the application of caustics or stimulating remedies, as nitrate of silver, iodine, cantharides, etc., to the interior of the uterus, have been recommended and tried. Again, hyperæmia of the cervix uteri may be produced by the application of an exhaustor, or dry-cupping apparatus, made specially for this purpose, resembling in shape an ordinary glass syringe, with an open mouth in place of a nozzle.

Occult or Concealed Menstruation.—Cases are occasionally met with where the symptoms of amenorrhœa are combined with those of dysmenorrhœa. These will be found on further investigation to be due to retention of the menstrual secretion from occlusion or atresia of the uterus, vagina, or vulva, or from imperforate hymen, which thus prevents the excretion of the fluid. Occult or concealed menstruation is the more appropriate term for this condition. It can hardly be regarded as amenorrhœa, since the ovaries are acting healthily and normally, the uterus responds, the menstrual blood is duly secreted but fails to gain exit externally, is in fact retained within the body. In the larger number of instances the retention takes place *ab initio* from some congenital defect or from some accident or disease occurring during childhood. Still, there are cases met with occasionally where occlusion of the genital passages may occur subsequent to puberty, generally in consequence of injury or disease following parturition, but also from other causes, as will be found mentioned under the head of Occlusion of the Vagina.

Chlorosis: chloro-anæmia, or green sickness, is often confounded

with anæmia and amenorrhœa, but deserves special mention as a separate and distinct form of neurosis of the ganglionic nervous system. It occurs chiefly in girls at the age of puberty, just at the time of transition from girlhood to womanhood, when the ovaries are starting into activity and the function of menstruation is becoming established. It is most frequently met with in large towns and among the upper classes, though by no means unknown in country districts and even among the very poor. A highly refined and artificial mode of existence, where the nervous system is developed disproportionately to the physical, seems to favor the production of this disorder.

Instances of its occurrence in young girls, and even boys, as well as in women during pregnancy or in those who have arrived at maturity, are spoken of by some authors, but we shall here consider only those cases most commonly observed at or about the age of puberty.

It has been described by ancient authors under the name of Spanæmia, Cachexia Virginum, Morbus Virginis, etc.

Causes.—The predisposing causes, if such they can be called, are generally spoken of as the age of puberty and the female sex. The active or exciting causes, which are often unsuspected at the time, are mostly circumstances of a depressing nature, such as uncongenial home influences—want of sympathy or companionship, disappointment in love—or excessive mental occupation. Too severe or prolonged physical exertion, especially when confined to the house, the patient seldom getting exercise in the fresh air; much grief or prolonged mental anxiety, as frequently happens in cases of severe family illness terminating in death, where prolonged watching and loss of sleep serve to exhaust the nervous system; great fear suddenly excited, as also home-sickness, have all been known to produce chlorosis. Erotic excitement without gratification, and the constant struggle between lascivious desires and a sense of right, more especially in young girls educated beyond their station, is unquestionably a far more frequent cause of chlorosis than is generally imagined.

Pathology.—The condition of the blood in chlorosis differs considerably from that in health; the density is diminished, the amount of water being relatively increased, and the proportion of the globules diminished.

As a rule, the amount of fibrin and fatty and saline constituents, as well as the albumen, retain their normal proportions, though in very severe and obstinate cases the latter constituent is diminished, and dropsy results. It must be remembered, however, that well-marked symptoms of chlorosis may exist with little or no evidence of blood-change.

The red and white corpuscles of the blood become less numerous, without the occurrence of any disturbance in the numerical relation between them. Chlorosis differs from other forms of anæmia chiefly in the fact that the deficiency in hæmoglobin is far more than proportionate to the deficiency in number of the red

corpuscles, which explains the greenish tint and extreme degree of pallor of the skin. In leukæmia, colorless corpuscles in some sort take the place of the red ones, and a real diminution in the number of the cellular elements in the blood is not produced.

The Germans regard chlorosis as a disease of congenital rather than acquired character. In any case the foundations are very early laid, for the aorta and the larger arteries are usually, and the heart and sexual organs frequently, found imperfectly developed.

The *symptoms* indicating the approach of chlorosis are, generally, depression of spirits without any obvious cause to explain it, irritability and unevenness of temper, nervousness, despondency, vague ill-defined longings, rapidly succeeded by loss of appetite, flatulence, dyspepsia, and constipation.

At times the appetite is very depraved, such articles as slate-pencils, chalk, gritty substances of any kind, pickles, sour apples, vinegar, unripe fruit, etc., being preferred to ordinary wholesome food.

The characteristic waxy tint of the complexion soon declares itself, a sort of "green and yellow melancholy;" palpitation of the heart, dyspnœa, coldness of the extremities, irregular flushings of the face and other anomalous symptoms succeed, together with scanty or suppressed menstruation, neuralgic pains in various parts of the body, tenderness on pressure over the lower cervical or upper dorsal region, distress in the solar plexus, as evidenced by feelings of sinking, hollowness, sighing or yawning, and even fainting.

Hysterical attacks are not infrequent; unusual drowsiness, and even convulsions and mania may supervene, but are not commonly met with. In some instances the prostration is very marked, the patient being tired on the least exertion, and palpitation ensuing. She becomes languid and listless, nervous and depressed, seeking solitude, and indisposed to exertion; symptoms of suicidal mania occasionally declaring themselves if the case be not properly attended to.

The symptoms vary in different cases, in one headache or neuralgia, in another dyspnœa and palpitation, or gastralgia, or menstrual disorder, or general feebleness predominating. The function of menstruation becomes disordered, being irregular in its appearance, or even entirely suppressed, the secretion itself being scanty, much paler in color than normal, and often more like leucorrhœa than menstrual fluid.

Dysmenorrhœa is often complained of.

The heart, ill-nourished, becomes excessively irritable, and is easily excited to hurried action by physical exertion or emotion, palpitation being a very frequent symptom; severe pain under the heart is also complained of, and fainting is not infrequent. Owing to the feeble circulation, the watery condition of the blood, and the general laxity of all the tissues, the face often becomes puffy, the hands and feet swollen from effusion of serum into the cellular tissue. The extremities are generally cold and very liable to chilblains in winter. Ecchymoses occasionally take place, more espe-

cially in the region of the tibiæ, giving rise to the condition termed *erythema nodosum*.

Diagnosis.—The diseases most liable to be confounded with chlorosis are cardiac disease, tuberculosis, and anæmia. On auscultation, a loud systolic murmur is heard over the base of the heart, together with a well-marked *bruit-de-diable* on either side of the base of the neck. The quality and intensity, the peculiar “bellows murmur,” heard best over the base of the heart, will generally be sufficient to enable the practitioner to diagnose between a functional and an organic murmur.

In chlorosis the respiration as a rule is normal in character, and there is no evidence of dulness at the apices, as met with in tubercular deposition.

Occasionally chlorosis is liable to be mistaken for the early stage of jaundice, but attention to the general symptoms should preclude any error in this respect. Effusion into the pleuræ or peritoneal cavity occurs at times in cases of chlorosis with marked anæmia, leading to the supposition that pleuritic effusion or dropsy from Bright’s disease, cardiac disease, or chronic peritonitis has taken place. The absence of albumen in the urine, and the condition of the patient generally, will suffice to clear up the diagnosis. Dr. Thomas thus contrasts the most striking differences between the two diseases, anæmia and chlorosis:

Anæmia.

Is merely impoverishment of the blood, due to want of nourishment, from some drain upon the system, or from some poison in the blood.

Can usually be accounted for by the discovery of some special cause.

Occurs at all periods of life, to men, women, and children.

Is readily curable by removal of cause, supply of good diet, and administration of iron.

Is always characterized by impoverishment of blood.

Produces a puffy and pale appearance.

Does not ordinarily produce sadness or great nervous disquietude.

Is not especially accompanied by visceral neuralgia.

No special affection of solar plexus of nerves.

Iron always does good.

The cause of the disease being removed, patient will rapidly improve.

Chlorosis.

Is a disease of the nervous system, and may occur with or without the production of its most common symptom, anæmia.

Cannot.

Occurs in true type, usually to girls about time of puberty.

Is affected favorably only by remedies which act upon the nervous system, as alteratives and tonics.

Sometimes exists without.

Produces a light green color.

Commonly does.

Is constantly.

Pain, uneasiness, or distress commonly referred to solar plexus.

Iron often fails to benefit.

If supposed cause be removed, patient will often improve but slowly.

Anæmia is merely a blood-state, while chlorosis is a disease of the nervous system, which may or may not produce anæmia.

Chlorosis may be complicated by some serous form of organic mischief, such as cardiac disease or tuberculosis. We must be careful not to overlook these. Again, chorea, hysteria, hypochondriasis, and mania occasionally declare themselves.

The appearance of patients recovering from hæmatocele is not unlike that of chlorosis in some respects, but on inquiry there will generally be found a distinct history of some sudden pelvic mischief to assist us in forming an opinion, and on examination well-marked evidence of the nature of the affection will generally be apparent.

Treatment.—When confronted with a well-marked instance of chlorosis, our first effort should be directed to ascertaining the apparent cause of its production, with a view to obviating it. This will often necessitate a careful and minute inquiry into the circumstances surrounding the patient—social, hygienic, and otherwise. We must not content ourselves with discovering a general condition of anæmia and prescribing iron, we must seek further for the cause or combination of causes likely to have produced this condition, and if possible remove them.

Supposing we are unable to detect any sufficient cause in the patient's surroundings, though we may feel confident that such exists, our plan will be to break up present associations by suggesting change of air and removing the patient from the conditions under which the neurosis declared itself.

No little consideration is required in advising the friends where best to go to; this will depend considerably upon the time of year, and whether the patient resides in town or country; if the former, a change to the sea-side, should the season be favorable, or to some agreeable country resort where cheerful society and out-door occupations—riding, driving, walking, etc.—can be obtained; if the latter, a trip to town, with its numerous attractions of shop-windows, picture-galleries, and places of amusement, will form a pleasing contrast to the quiet and often monotonous routine of country life, and will probably conduce more towards restoring the patient to a condition of health than any pharmacopœial production, however elaborate.

Where it is possible, a visit to the Continent or some foreign town, of which a sea-voyage forms a part, will prove of much service, and in obstinate cases should invariably be resorted to.

In any case out-door exercise should be insisted on; this, to be of service, must be regular and short of fatigue. At first carriage exercise or boating, changed for riding on horseback and rowing as soon as the patient is equal to the exertion, together with daily walks and out-door amusements.

The recent introduction of skating-rinks and gymnasiums offers an agreeable incentive to exercise, but where these facilities do not exist, dancing, lawn tennis, bowling, and other similar amusements should not be forgotten.

Sea-bathing—about mid-day—when the sea is not too rough or the weather too cold, provided the patient has sufficient vitality to produce a reaction, and headache and languor do not ensue, is frequently very beneficial.

The inhalation of oxygen has also been recommended as tending to improve the appetite, and thus contributing to alter the condition of the blood.

Electricity has proved sufficiently beneficial in several cases to justify its further trial, the continuous current being employed, or such other form as may be specially indicated in any particular case.

The diet will need to be light, nutritious, easily digestible, and varied; milk, eggs, beef-tea, broth, jellies, fish, game, poultry, and meat if it can be taken.

Wine, such as Burgundy, claret, or champagne, will often incline the patient to partake of food that she would not otherwise attempt, and will also assist digestion and improve the general health. Beer may be tried if desired. In some cases spirits are requisite, freely diluted with effervescing waters.

As regards medical treatment, the nervine tonics, such as strychnia, quinine, arsenic, and phosphorus, in their various combinations with iron, will materially assist recovery; but it must always be remembered that medicinal treatment *alone* will seldom be sufficient.

In place of the abominably nauseous and disgusting mixtures formerly in vogue, the more elegant and palatable forms of the citrates and tartrates should be employed.

Thomas recommends a mixture composed of sol. pot. arsen. ʒij, tinct. nucis vom. ʒiv, ferri vini amari ʒviijss.—M. A dessert-spoonful, in a claret-glassful of water, just after each meal. The ammonia citrate of iron (gr. v-vij) in effervescence, the liq. ferri dialysatus, the solution of acetate of iron, the citrate of iron and quinine (gr. v-vij), the saccharated carbonate (gr. v-x), the ferri oxidi magneticum (gr. v-x), the syr. ferri phosph. c. quiniâ et strychniâ—Easton's—(ʒj), and other similar preparations, as given when speaking of the treatment of anæmia, should be fairly tried. Where mixtures are objected to, small pills of the ferri arseniat. (gr. $\frac{1}{16}$ -j), ferri lactat. (gr. ij-ijj), ferri redacti (gr. iij-v), etc., in combination with quinine, strychnia, or phosphorus, will often be readily taken.

Vicarious or Ectopic Menstruation.

This is said to occur when a periodical discharge of blood takes place from some other organ or tissue than that of the uterine mucous membrane. Its recurrence is regular and always in connection with the menstrual period, showing that there is an excess of vascular tension, which is not relieved in the usual way at these particular times. Nature makes an effort to afford relief by a discharge of blood from some other part, generally from one or other of the mucous membranes, of which the Schneiderian is the most frequent seat. The epistaxis thus produced may either replace the usual menstrual secretion or may occur jointly with this latter. The mucous membrane of the stomach probably follows next in order—the hæmatemesis in some cases being very severe—far greater in quantity than the usual menstrual secretion it replaces.

Hæmoptysis occasionally takes the place of menstruation, as proved by the cessation of the former on the healthy establishment of the latter. As it is especially in young delicate girls that this

condition is liable to occur, fears are often entertained that it is but the precursor of serious chest-mischief.

The intestinal mucous membrane is not infrequently the seat of vicarious menstruation. This is more likely to occur in subjects of a somewhat plethoric habit. Where internal hæmorrhoids exist, there is often noticed an increased tendency for them to bleed at what would ordinarily be a menstrual period.

Ecchymoses of the conjunctival mucous membrane, and even retinal hæmorrhage, have been observed.

The skin in some cases is made the channel through which the blood exudes, often in the form of petechiæ or small ecchymoses, in others occurring as a capillary hæmorrhage or true bloody sweat. In erythema nodosum we have patches of limited hyperæmia or ecchymosis appearing as painful nodules over the shins, more rarely on the arms. Extreme debility of the walls of the vessels allows either exudation or effusion of blood to take place, and may possibly be regarded as a form of vicarious menstruation. If any varicose ulcer exists, vicarious hæmorrhage not infrequently takes place from its surface.

The pressure on the circulation, or vascular tension, may be relieved in other ways than by hæmorrhage in some cases. Thus an unusual increase of the natural secretion from some organ, such as the occurrence of diarrhœa, an increase of leucorrhœal discharge, or the production of œdema of the legs and face at the time when the ordinary menstrual secretion should take place, can only be regarded as an effort of nature to relieve the general tension of the vascular system. When the ordinary vicarious safety-valves fail, then the internal organs, as the brain, lungs, liver, or spleen, have to bear the strain. The foundation of structural organic disease may thus be laid.

The vicarious discharge consists of blood solely; it comes on suddenly and often continues at intervals for some days, unless the loss be severe at first, when it is not repeated. It may alternate with the natural menstrual flow, or may occur at more or less regular intervals for several consecutive months.

About the menopause, a smart attack of epistaxis, hæmatemesis, or melæna from internal hæmorrhoids is not infrequent, causing much alarm and anxiety, it may be, to the patient and her friends. In place of harm, however, it often seems to act beneficially, as a derivative, preventing serious local congestions or effusions, as apoplexy, pelvic hæmatocele, etc. The seat of the discharge is often determined by the previous delicacy of an organ or tissue.

The absence of any constitutional disturbance such as would characterize the local affection were it primary and not vicarious, will generally enable us to determine the nature of the discharge.

Attacks are rarely fatal, nor does any harm to the organ or tissue implicated seem to arise. In most of the cases the uterus resumes its normal function and the vicarious discharge is superseded.

Treatment.—As the hæmorrhage has actually taken place generally before we are summoned to the patient, but little can be done; and

even if we are called in early, it may not be prudent to attempt to arrest it. After it has once occurred, if we have any reason to believe that the attack will be repeated, means should be resorted to to relieve the system in a less questionable manner. In plethoric patients a brisk purge of hyd. subchlor., followed up by a Seidlitz powder or some natural aperient water, a warm hip-bath or pediluvium, cupping over the sacrum, or a few leeches to the anus or inner side of the thighs, will often prove of service in determining the return of the natural function. In the interval the general health should be attended to, the diet restricted, if necessary the bowels regulated, and any other indications dealt with as seems advisable. In young and delicate girls epistaxis is by no means infrequent. Here some form of iron, combined or not with strychnia or other nervine tonic, will generally be indicated. Warm clothing round the hips, flannel drawers in winter, and warm stockings, should be insisted on, and everything calculated to favor the pelvic circulation resorted to; warm baths being used nightly when there is any evidence of the menstrual molimen.

CHAPTER XXX.

DYSMENORRHŒA.

Dysmenorrhœa.—Where menstruation is performed with difficulty and pain, either or both combined, the term dys-men-orrhœa (δύς, difficult, μήν, a month, and ρέω, I flow,) has been employed to designate the condition.

Few women pass through their menstrual history without at some time or other suffering some inconvenience from the performance of this function, and some, unfortunately, never menstruate without serious discomfort at these times. In order to understand the subject thoroughly, we must bear in mind the relation between ovulation and menstruation, a fact almost universally admitted now, although the latter has been known to occur where both ovaries have been removed.

Pathology.—Dysmenorrhœa or painful menstruation is but a symptom of many and various conditions not only of the uterus and appendages, but also of the general health. Before we are in a position to deal with this symptom, we must endeavor to form some rational conclusion as to what are the predisposing and exciting causes producing it. To this end it will be well to consider first what are the usual derangements of circulation and innervation conducing to alter the function of menstruation and render it painful. Any condition of the general health interfering with the due correlation of the several functions, so as to produce anæmia, may be the exciting cause. Any abnormal condition of the uterus itself or of the ovaries may also produce it, a combination of two or more of these conditions being naturally more likely to cause it.

Varieties.—Most authors resort to some classification with a view to facilitating the study of the subject, and it certainly has its advantages, although we must not expect to be able to classify every individual case under any one heading, there frequently being a combination of causes to account for the phenomena. Without therefore attempting any arbitrary division of the subject, it may be well to mention those most commonly met with. These are:—
1. Neuralgic or sympathetic; 2. Congestive or inflammatory; 3. Mechanical or obstructive; 4. Membranous; 5. Ovarian dysmenorrhœa. The advantages of resorting to some classification seem to outweigh the objections that have been raised as to such a method being unscientific and not practical, and therefore we retain it, though the practitioner should remember that dysmenorrhœa is merely a symptom and not a distinct entity, to be driven out or remedied by any one mode of treatment.

Neuralgic Dysmenorrhœa.—Until very recently it has been the custom to classify under this head all cases in which no distinct

organic lesion of the uterus or its appendages could be detected. With increasing knowledge and a more careful study of the objective signs in contradistinction to the subjective symptoms, we shall doubtless be enabled to diminish very materially the number of cases under this heading, the supposed nervous phenomena being found to be due to some morbid condition of the uterus impeding the escape of the menstrual fluid, or to some alteration in the condition of the ovary.

Causes.—Any condition of the patient tending to produce an anæmic state of the system, such as is met with in most cases of ordinary neuralgia, is often sufficient to excite painful menstruation. Patients possessing a highly susceptible nervous temperament, associated or not with any hysterical disposition, such as is frequently seen among the highly refined young ladies in the upper classes of society, where, from luxurious living and enervating habits, the nervous system is inordinately developed, furnish a large percentage of these cases.

The rheumatic and gouty diatheses have been credited with being the predisposing cause of this form of dysmenorrhœa, so also malaria. There is also a so-called neuralgic diathesis which seems to predispose to this form of the affection. Enervating habits, such as onanism and immoderate indulgence in sexual intercourse, may also tend to keep up congestion of the ovaries and give rise to ovarian dysmenorrhœa.

Symptoms.—These vary in intensity not only in different patients, but in the same patient at different times. In some instances uneasiness, a feeling of weariness, aching round the lower back and abdomen, extending down the inner side of the thighs, shortly before the commencement of the flow, are complained of; symptoms disappearing on the establishment of menstruation, or continuing more or less severe until the cessation of the discharge. The pain is often spoken of as being fixed, severe, aching or twisting, generally situated within the pelvis, often radiating to the groins and down the inside of the thighs.

Other symptoms are usually present, such as great tenderness or soreness of the mammæ, with more or less tumefaction of the abdomen, headache, coldness of the extremities, and occasionally severe aching pain in some portion of the body, such as the bridge of the nose, outer side of the little finger, soles of the feet, etc.

Diagnosis.—Neuralgic differs from congestive dysmenorrhœa by the character of the pain and the attendant phenomena. In the former, other forms of neuralgia are not uncommon; the pain is more acute and agonizing, and generally lasts during the continuance of the flow, nausea, headache, hysteria, and even mania being not infrequent; whereas, in the latter the pain is more of a wearing, aching, dull, persistent character, relieved by the appearance of the flow, though possibly continuing after this has ceased.

Where the pain is due to inflammatory action we generally find marked evidence of this between the periods, such as bearing-down pain, leucorrhœa, tenderness on pressure over the uterus, etc.

In obstructive dysmenorrhœa the flow is intermittent, coming on frequently in gushes and then disappearing for several hours, severe colicky pains often preceding the reappearance, the pain being oftentimes so severe that the patient writhes in agony until the expulsion of a clot, when the pain ceases.

Treatment.—Our principal object should be to improve the general health as far as possible, and to raise the tone of the nervous system. Quinine and iron with strychnia; quinine alone, or in conjunction with nitro-muriatic acid; arsenic, phosphate of zinc, and other similar remedies, may first be tried.

The bowels should be carefully regulated, the action of the skin encouraged by means of baths, friction, and the wearing of flannel. If the nervous system has been deteriorated by habits of luxury, indolence, or dissipation, these must be altered. Regular exercise on foot or horseback, country air, avoidance of late hours and heated rooms, early rising, regular meals of plain, wholesome food, and some out-door occupation, will do much to improve the health.

If there be any evidence of the gouty or rheumatic diathesis, colchicum, guaiacum, the salts of potash, especially the tartrate and citrate, may be administered.

If chlorosis be present, chalybeates, strychnia, phosphorus, together with change of air and cheerful society, should be resorted to.

If malarial poisoning be suspected, a change of residence, quinine, arsenic, iron, etc., may be advisable.

During the paroxysm various measures may be resorted to with a view to affording relief.

The tinctura cannabis indicæ in 15- to 20-minim doses, or the extract in half-grain or grain doses, combined with musk, camphor, and assafoetida where there is any hysterical tendency; sulphuric ether in half-drachm doses, given with liquor opii sedativus or tinct. chloroformi co. in 15-minim doses, are often very efficacious.

Bromide of potassium and ammonium in scruple to half-drachm doses every four or six hours often allay the pain. Chloral in 15- to 20-grain doses, or even half a drachm, at bedtime, secures sleep and relieves the pain and restlessness.

The hypodermic injection of morphia, commencing with one-sixth and increasing the amount until the desired effect is attained, or the administration of an enema containing 20 to 30 drops of laudanum, or the employment of belladonna, morphia, and atropine pessaries or suppositories, are all useful means for allaying pain.

Where the agony is intense and mania or delirium occurs, it may be requisite to resort to chloroform or ether; but this should never be done until other expedients have been tried and failed.

Apiol, administered in mv doses in form of capsules, has been highly recommended. When the patient feels the twinges, showing the effort of nature to establish the flow, apiol will bring it on

in about three or four hours. The beneficial action when it occurs is usually prompt. If it does not produce its good effects speedily, it probably will not at all. It acts as an emmenagogue. The capsules may be given every three hours. Four or five will generally be sufficient if there be any effort on the part of nature to establish the flow.

Two or three drachms of tincture of assafoetida in three ounces of warm water, given as an enema, may also be tried, or a scruple of chloral in eight ounces of warm water or gruel.

Locally the occasional passage of the uterine sound, the introduction of a galvanic stem, the employment of galvanism to the interior of the uterus in the intervals of menstruation, or the injection of warm water night and morning *per vaginam*, may prove of service. Where marriage occurs, and parturition takes place, a complete cure is often effected.

The practitioner should, however, be careful not to take the responsibility of advising either very young girls or people advanced in life to resort to this experiment, for if it do not succeed, or the malady be intensified, he will be sure to be blamed for suggesting such an expedient.

Spasmodic Dysmenorrhœa.—Dr. Duncan speaks of this variety, extensively known as neuralgic, and generally described as obstructive or mechanical, as being a disease of the nature of a neurosis, in which the contractions of the uterus cause great pain.

Physiologists are agreed that there are contractions more or less regularly going on in the unimpregnated uterus of women, and especially during menstruation, whether healthy or morbid. In some conditions of disease, as in cases of uterine fibroid that are embedded in the uterine walls, the contractions are easily made out. They may be either clonic or tonic, the former being probably the more frequent, coming and going like ordinary labor-pains. In severe cases the contractions not only affect the uterus, but may also affect the bladder and rectum, producing strangury and tenesmus, and also violent bearing-down by reflected influence.

Spasmodic dysmenorrhœa may occur at any time. The woman may have the violent pains of dysmenorrhœa apart entirely from ovulation or menstruation.

In the majority of cases the pain begins before menstruation begins, being most severe just as the flow commences, and diminishing as soon as the flow is free, a fact rather subversive of the mechanical theory. There is frequently most pain when there is least discharge; when for any reason the flow is scanty, the dysmenorrhœa becomes worse and worse, but when the flow is abundant the pain diminishes.

Another fact rather inconsistent with the popular theory of mechanical obstruction by stricture, is that even in the severest cases there is absolutely no pain for one or two periods, and then the pain returns as badly as ever. Again, whilst a patient is in the agonies of spasmodic dysmenorrhœa, a fair-sized bougie—No. 8, for instance—may generally be passed with facility.

In a healthy woman the internal os uteri and the whole interior of the body of the uterus are sensitive; the touching of them by a probe is disagreeable. In a woman suffering from spasmodic dysmenorrhœa, the pain of touching the internal os is intense, and the pain is aggravated by passing the sound further on and touching the body and fundus; and in every characteristic case the woman at once tells you that there is the pain of her disease.

Treatment of Spasmodic Dysmenorrhœa.—Dr. Duncan says medicines are not of much service. Their great number and variety is a sufficient proof of itself that they are inefficient. Those which are most valuable are laxatives, especially salines, diaphoretics, hip-baths, and guaiacum.

Lastly, there is the treatment by drowning the pain with narcotics and anæsthetics; but beware of making them opium-eaters, and so producing a greater disease than the one you are attempting to cure.

Mechanical treatment by graduated bougies often proves of service when all other means have failed. Instances are not unknown where a single passage of a moderate-sized bougie through the internal os uteri succeeded in removing effectually a condition that for years had caused much distress at every recurring monthly period.

Even in virgins the employment of bougies is perfectly justifiable where the pain is so severe as to preclude the patient earning her livelihood, in that she is unable to keep any situation, as she has to rest up three days every month in bed. Again, in cases where suicidal mania is developed at these times, any treatment that holds out the least promise of success is justifiable.

Congestive or inflammatory dysmenorrhœa occurs where, from some alteration in the condition of the uterus and its appendages, the normal periodic congestion is inordinately increased or prolonged, the menstrual flow not affording relief, much distress ensuing in consequence. In the true congestive form the pain usually precedes the appearance of the flow by some few days, and is relieved in intensity when this occurs, but there are numbers of instances where the pain is only lessened and does not entirely disappear for several days after the period has ceased.

Where inflammation of the uterus or its appendages exists, even though this may not be sufficient to produce marked symptoms during the intervals of menstruation, severe pain may result when an increased determination of blood to the parts takes place, as occurs at each menstrual epoch.

Causes.—Certain states of the general health tend to induce congestion of the pelvic organs, and may prove to be the exciting cause; such are general plethora, constipation, and the accompanying sluggishness of the portal circulation. Exposure to damp and cold during menstruation is frequently sufficient to check the flow, and often proves the starting-point of much future discomfort. Strong emotional excitement during the period occasionally has the same effect.

Among what may be called local causes may be mentioned displacements of the uterus—whether of the nature of prolapsus,

flexion, or version—the presence of fibroids in the wall of the uterus, chronic metritis, with induration or hypertrophy of tissue, the areolar hyperplasia of Thomas, various forms of inflammation, whether of the uterus itself or its surroundings, such as endometritis, pelvic peritonitis, pelvic cellulitis, etc.

Symptoms.—Any interference with normal menstruation such as we have just referred to, may give rise to much constitutional disturbance—feverishness, restlessness, nervousness, headache—together with marked pelvic discomfort, pain in the lower back and groins, arrest or diminution of the menstrual flow, with occasionally much sympathetic irritation in the neighboring viscera, such as tenesmus or diarrhœa.

On vaginal examination the uterus is found to be exceedingly tender, the patient instinctively shrinking if external pressure be tried over the lower abdomen. The uterus is generally increased in bulk, and lower in the pelvis than normal. Pain in one or other ovarian region is also complained of, more frequently on the left side.

Mechanical impediment to the passage of the menstrual discharge ensues from tumefaction of the mucous membrane, more especially at the internal os uteri, and pain results from the nervous irritation induced.

Diagnosis.—The fact of menstruation having previously been performed naturally without suffering, the history of its having been suddenly arrested, the dull, aching character of the pain, which, although it may be lessened on the appearance of the flow, generally persists even after the period has passed, will assist us in forming our opinion as to the nature of the pain when due to congestion simply. Where the pain is due to inflammatory mischief, we shall generally have the history of bearing-down, leucorrhœa, pain on standing or walking, and other symptoms, during the intervals of menstruation. A vaginal examination will confirm our suspicions, and enable us to form a more definite opinion as to the character of the disorder. The introduction of the uterine sound will assist materially in differentiating cases of this nature from the obstructive form of dysmenorrhœa.

Dr. Henry Bennet, in his *Treatise on Inflammation of the Uterus*, says: In many of the instances which I have seen of chronic inflammation in the virgin female, the most prominent symptom has been dysmenorrhœa in a very severe form. Indeed, I am convinced that most of the cases of extreme and obstinate dysmenorrhœa and disordered menstruation, which are at last considered hopeless, and are merely palliated by narcotics, will be found on careful scrutiny to be cases of ulcerative inflammation of the uterine neck, sometimes accompanied by chronic inflammation of the body of the uterus, either general or localized. When the cervix is inflamed and ulcerated, the menses, whether they have previously been easy or difficult, generally become painful, sometimes agonizingly so, all the local pains being much exaggerated.

Treatment.—This will depend materially upon the causal condition. In plethoric subjects, some form of mercury, as blue pill, calomel or hyd. c. cret., given alternate nights with rhubarb or colocynth, followed in the morning by some saline aperient, such as a Seidlitz powder, Pullna bitters, Vichy water, Carlsbad salts, Rochelle salt, sulphate of magnesia, etc., is generally indicated; care being taken also to limit the diet, restrict the amount of stimulants or prohibit their employment, increase the amount of exercise, and follow up any other indications the individual case may present.

Where the congestion seems due to sudden suppression of the catamenia from catching cold, a warm hip-bath, warm enemata or a vaginal douche, a draught composed of sulphuric ether, morphia, and tinct. chlorof. co., with a view to relieving pain and encouraging the return of the menstrual flow, will often prove of great service, or a Dover's powder, to encourage diaphoresis, may be given. A few leeches applied to the uterus just before or immediately following the period, will often afford much relief and cut short the disorder.

Should any misplacement of the uterus exist, a Hodge or other convenient form of pessary must be carefully adjusted, and other precautions taken to relieve the condition. Should a fibroid exist, the question of its removal must be considered.

If metritis in any of its various forms seems to be the exciting cause, much benefit will be obtained by the application of a few leeches; three or four to the os uteri, repeated or not as may seem necessary, just before the advent of the period or immediately after its cessation.

In many of these cases, small doses of the biniodide of mercury given with cinchona, persevered with for many weeks, will materially relieve the symptoms.

Obstructive dysmenorrhœa is more especially applied to cases where the discharge of the menstrual secretion is impeded in some portion of its course, either from congenital defect or from some acquired condition, whether atresia or flexion.

Pathology.—The mucous membrane lining the body of the uterus, undergoing as it does a molecular disintegration followed by hæmorrhage at each monthly period, any impediment to the free discharge *per vias naturales* will cause either partial or complete retention; the natural consequence of this is distention of the uterus, efforts at contraction by the muscular fibres, nervous irritation, and violent spasmodic efforts at expulsion, constituting what may be termed uterine tenesmus or colic. If the expulsive efforts are sufficient to overcome the obstruction, relief ensues, but if not, the contractions continue, the pain at times being so intense that the patient rolls on the floor writhing in agony.

In cases of ante- and retro-flexion, where occlusion at the internal os occurs from the canal being bent upon itself, accumulation of the menstrual secretion takes place in the retort-like cavity of the uterus, until, from the distention produced, and the efforts

at expulsion, the fundus becomes raised in a line with the cervix, allowing a gush of fluid to take place, when the fundus again falls and fresh accumulation commences, the same series of phenomena being oft repeated.

Causation.—There are certain congenital defects which may cause obstruction, such as contraction of the cervical canal or occlusion of the internal or external os uteri, conical cervix, acute flexion of the body of the uterus on the cervix, atresia vaginæ, imperforate hymen, etc. Similar conditions may be induced or acquired by inflammation affecting the lining membrane of the cervix, or from lymph being deposited in the tissue of the cervix and so interfering with the calibre of the canal. The use of the actual cautery or any of the more powerful caustics—or rather the abuse—may produce closure of the cervix.

The presence of a small polypus near the internal os has been known to impede the passage of the menstrual discharge; small fibroids in the tissue of the cervix also interfere with the patency of the canal. Occlusion of the vagina from injury or sloughing after protracted labor, in cases of fever and severe forms of epidemic leucorrhœa, occasionally produces complete obstruction.

There are other causes of obstruction external to the uterus, such as pelvi-peritonitis, pelvic cellulitis (where the uterus becomes firmly fixed and bound down by adhesions), and hæmatocele, causing pressure, and keeping up a more or less constant state of congestion in the uterus.

Where, on examination, the axis of the uterus is found to be normal, not bent at right angles, as in cases of acute flexion, and the uterine sound can be made to pass without difficulty, it seems incredible that obstruction should occur, and yet there are many eminent gynecologists who regard the internal os as by far the most common seat of obstruction, and direct all their attention to this point. They contend that it is so narrow that very little is needed to close it altogether, or at all events to so close it that the escape of fluid from the uterine cavity is rendered difficult. It is true the quantity of the menstrual secretion varies in different cases and under different circumstances, and a canal which may be a very sufficient outlet at one time may be quite inadequate at another.

In reply to those who contend that the cervical canal is too small to allow the slow and gradual *stillicidium* of the catamenia through the canal, and that the menstrual fluid is thus retained or dammed up, or cannot pass out of the cavity of the uterus fast enough, it will be well to bear in mind the following facts.

The amount of sanguineous discharge at each catamenial period varies in different patients both in duration and quantity, and even in the same patient at different seasons or under different circumstances. The flow varies in duration from three to six days, possibly four would be a fair average; the quantity varies from about six to eight ounces.

Allowing that the loss is eight ounces and the average duration

four days, that leaves 2 oz. to pass within the 24 hours, that is 960 drops; this divided by 24 gives 40 drops every hour, or about two-thirds of a drop every minute. Now, when we remember that the cervical canal is at least three-sixteenths of an inch in diameter, it seems difficult to imagine how this could offer sufficient impediment to the passage of so small a quantity at a time as above calculated.

Symptoms.—These vary considerably in different patients. There is generally a weary, dull, aching pain complained of in the lower abdomen and back, extending to the loins and iliac fossæ, and not infrequently down the inner side of the thighs, gradually increasing in severity and producing such distress that the patient is unable to keep up or to attend to any of her ordinary duties. The character of the pain varies at different times. It is sometimes described as an intense feeling of weight and bearing-down, causing nausea or even vomiting, headache, faintness, and great prostration. Frequently it assumes a spasmodic character; violent expulsive efforts, so-called uterine colic, alternating with periods of comparative ease, often giving rise to the supposition that a miscarriage is imminent, and this view is favored by the passage of clots, due to the obstruction preventing free excretion, and the menorrhagia induced by the extreme hyperæmia. Where the obstruction is so marked as to cause more or less complete retention, decomposition of the accumulated blood ensues, producing much febrile and irritative disturbance of the system, and thus apparently confirming the supposition that a miscarriage has occurred. The pain at times is so intense that the patient writhes in agony; cold, clammy perspiration bedews the forehead, symptoms of collapse or utter prostration ensue, retching of a severe kind supervenes, and in addition to all this considerable distention of the abdomen, making the patient feel as if she would burst, with stupor, delirium, or even mania, may occur. There is usually some diminution of the pain and abatement of the other symptoms when the discharge is once fairly established, but generally the pain continues throughout the period, and in some cases also persists during the greater portion of the interval between the periods. Metrorrhagia, and in some instances hæmatocele, occurs in consequence of the continued obstruction, with occasionally a sharp attack of pelvi-peritonitis.

Diagnosis.—This can only be effected by a careful examination of the patient during the interval, by means of the uterine sound. Should the uterus be found to be the seat of the obstruction, conjoined manipulation should always be resorted to in order to detect the presence of flexions, fibroid tumors, etc.

A careful consideration of the symptoms will generally enable us to differentiate the obstructive from the other forms of dysmenorrhœa, and where the symptoms are marked, physical exploration should invariably be resorted to, whether the patient be single or married. It must be borne in mind that in some cases of early utero-gestation where a granular condition of the cervix exists,

pains not unlike those met with in cases of obstruction are present at each recurring menstrual epoch. The fact of menstruation having been regular and painless, and then suddenly ceasing, together with the presence of the usual symptoms of early pregnancy, should enable us to differentiate these two conditions.

Treatment.—Where dysmenorrhœa depends upon narrowing of the external or internal os uteri, the method of overcoming the difficulty will be found fully discussed under the Malformations of the Uterus (pages 49–60).

Where obstructive dysmenorrhœa results from flexion, this must first be remedied before any more radical means are adopted. The various methods have been described when speaking of flexions. To prevent the possibility of acquired atresia of the cervical canal resulting from the application of strong caustics in cases of cervical endometritis, care must be taken to avoid using them too energetically or persevering for too long a time.

If a small polypus be detected near the internal os as the cause of the obstruction, the cervix must be dilated and the growth removed.

Atresia of the vagina or imperforate hymen must be dealt with as indicated when speaking of these conditions.

Membranous dysmenorrhœa consists in the expulsion of organized material from the uterus at the menstrual periods, which is composed of the lining membrane of the uterus, either in shreds, or as a triangular sac representing a cast of the cavity of the body of the uterus, the openings of the Fallopian tubes and internal os being plainly visible. The process is usually attended by pain, often very severe in character.

It would take up too much space to discuss fully the various theories that have been advanced respecting the nature of this product.

The view generally received at present is that advanced by Oldham, viz., that the entire mucous membrane of the body of the uterus is exfoliated, a true menstrual decidua being thrown off at each catamenial period. Microscopic research confirms this view the cast being found to consist of the lining membrane of the uterus, hypertrophied in all its elements, almost exactly as it is in pregnancy.

The investigations of Kundrat and Engelmann ("Stricker's Med. Jahr.," 1873, page 135) have thrown new light upon what we know of membranous dysmenorrhœa, *i. e.*, the menstrual discharge of the superficial part of the uterine mucous membrane in a more or less coherent form.

In normal menstruation the upper layers of the proliferated mucous membrane are exfoliated, and thereby a hæmorrhage is occasioned. In membranous dysmenorrhœa there is an enhancement of this process. Considerable layers undergo fatty degeneration, and are then exfoliated, no longer in minute particles, but as shreds or as a coherent membrane. This latter process has been observed in cases of poisoning by phosphorus.

In some instances the membrane forms a distinct cast of the uterus, the orifices of the Fallopian tubes and the internal os uteri being distinguishable. It varies in thickness. The internal surface corresponding to the interior of the uterus is smooth, irregularly subdivided by furrows, and perforated like a sieve by the openings of the glands of the uterus. The external surface, where the separation took place, is bloody, rough, shreddy, or villous, often the more so from fibrinous deposits.

Under the microscope the membranes are found to consist of the connective tissue of the mucous membrane penetrated by the glands, and of a very abundant new formation of connective tissue, comprising large round cells, the so-called decidua cells (Schroeder).

Dr. John Williams, in a paper communicated to the Obstetrical Society of London, having watched carefully a series of cases for many years, comes to the following conclusions:

1. The dysmenorrhœal membrane is not the product of conception, but the decidua ordinarily shed as *débris* with every menstrual epoch.

2. It is expelled as a whole or in masses, in consequence of the presence of an excess of fibrous tissue in the wall of the uterus; this excess is due to imperfect evolution at puberty, imperfect involution after parturition or abortion, or is the product of acute inflammation.

3. The membrane is neither the result of an ovarian congestion, nor of an hypertrophy of the ordinary decidua.

4. The chronic inflammation present is usually the result of the monthly expulsion of the decidua from the uterus, and plays an accidental part only in its production; the inflammation may, however, be independent of the expulsion of the membrane, but it has no causal relation to the formation of the latter.

5. Sterility is not necessarily associated with the affection, but is the result of the condition induced by the expulsion of the membrane from the uterus, inflammation of the uterus and ovaries.

6. The membrane may be expelled without pain.

7. Inflammation of the uterus greatly aggravates the suffering caused by the passage of the membrane along the cervical canal.

8. Great relief may be obtained by curing the inflammation of the cervix, though the membrane continues to be expelled every month.

9. In order to effect a cure, the structure of the whole of the body of the uterus must be changed.

Dr. Barnes affirms from his own observation that the membrane expelled in some cases of dysmenorrhœa consists essentially of fibrin and mucus, and does not contain the elements of mucous membrane. He further adds: "It is important, then, to bear in mind that the membranes associated with dysmenorrhœa are not all of one kind."

As to the *cause* giving rise to this condition, various theories are still held. Some regard it as the result of endometritis, a layer of plastic lymph being formed and becoming organized—an exudation, in fact, similar to that formed in diphtheria, croup, and plastic

bronchitis. Others consider that the membrane is formed under the ovarian stimulus, that it is an exfoliation of the mucous membrane, due to congestion and irritation transmitted to the uterus. Simpson attributed the exfoliation to an exaggeration of a normal condition, or to an exalted degree of a physiological action.

Some still contend that the membrane is the result of an early conception, and that it is never met with in virgins.

But even Dr. Barnes admits that though the greater number of the cases of membranous dysmenorrhœa that he has met with occurred in patients leading a married life, and the menstruation had been some days in arrear, at the same time we must bear in mind that no aggregate of cases, however large, in which this association was verified, can absolutely exclude the possibility of the discharge of a dysmenorrhœal membrane by virgins.

Recognizing this possibility, we must go further, and affirm that we cannot, without imminent risk of falling into scientific error and unjust suspicions of the chastity of the patient, admit that any structural character of a membrane cast from the uterus, short of the detection in it of chorion villi, is proof of impregnation.

Differentiation.—The conditions most likely to be confounded with exfoliation of the mucous membrane are early abortions; blood-casts or fibrinous moulds of the uterus; exfoliation of the vaginal mucous membrane, whether from some morbid process or from the application of any strong preparations, such as perchloride of iron, carbolic acid, etc.; diphtheritic endometritis. When using astringent injections of alum, zinc, etc., for leucorrhœa, patients often pass shreds of coagulated albuminoid mucus, described as bits of skin.

The first of these is the only one likely to cause any serious difficulty as regards diagnosis. If we believe, as Dr. Barnes asserts, that “this form of membrane is restricted, not indeed absolutely, but with rare exceptions, to women leading a married life,” the mere fact of a patient who is single having passed such a membrane, raises at once the question of her chastity. In a medico-legal aspect this point is of great importance, and the practitioner should be exceedingly careful in hazarding the expression of an opinion even, that some young girl has had a miscarriage when in reality she has only passed a dysmenorrhœal membrane. As Dr. Barnes very lucidly puts it, “If it be admitted—and observations in point are now so numerous and authentic that it can scarcely be disputed—that the mucous membrane, under simple ovarian menstrual excitation, does undergo a high degree of development not distinguishable from the decidua of early pregnancy, it must also be admitted as possible that the mucous membrane so developed may be cast off.” Raciborski, in his “Treatise on Menstruation,” has shown that the dysmenorrhœal membrane is generally in shreds, thin and membranous, triangular, and showing the orifices of the tubes and the os internum uteri. It is always expelled at a menstrual epoch.

On the other hand, the decidua of early abortion is generally thicker, blood being extravasated in the substance; in shape it is

more ovoid; the tubal orifices are not easily made out, and it is generally passed after a period has been suspended. In fact there have been symptoms of early pregnancy, and generally some exciting cause, to explain the throwing off of the ovum. If this latter be entire, the risk of mistaking it for a dysmenorrhœal membrane is still more remote.

A careful examination of the expelled product, if necessary teasing it out under water, and submitting portions to the microscope, will enable the practitioner to discriminate between the membrane in question and the other conditions mentioned. The vaginal epithelial layer differs materially in its structure from that of the uterine mucous membrane.

Symptoms.—Pains in the hips, groins, and lower abdomen usually occur some little time before the expected appearance of the catamenia. These increase in severity and become more paroxysmal when the flow commences, until at length they become very violent and expulsive, like labor-pains, and continue so until the membrane is expelled, when the pain, as a rule, abates, although the hæmorrhage continues, often profusely, for another day or two.

It does not necessarily follow that at each period shreds or casts of mucous membrane are expelled. Some periods are almost painless. Sterility is an almost invariable consequence.

Treatment.—In furtherance of the views advocated by Dr. John Williams, he advises that "our attention should be directed to those conditions which are likely to cause excess of fibrous tissue in the uterine wall. Every means should be adopted to favor the physical development of the young girl. The puerperal state should be carefully watched.

"The only means whereby a cure is likely to be effected when once the condition is established, is electricity, either in the form of the continuous current or as developed by a galvanic stem. The continuous current has proved successful."

Depending upon our views of the pathology of this condition will be our method of treatment. In any case the prognosis as to cure is extremely unfavorable, although in some instances impregnation, terminating in natural labor, has taken place, and other cases of complete cure have been recorded.

Most heroic remedies, such as the application of the actual cautery to the cervix, division of the cervix by the metrotome, passing nitrate of silver up to the fundus, and other similar measures, have been resorted to; but until we have clearer views as to the pathology of this affection, our efforts at best can be but experimental.

If there be any evidence of syphilis affecting the constitution, the influence of mercury, both constitutionally and locally, may be tried.

On the theory that the shedding of the mucous membrane is a mere "menstrual miscarriage," or "fruitless pregnancy," as advocated by Lawson Tait, caused by an absence of complete fertility in one or other parent, most probably on the part of the male, prophylactic treatment in the way of abstinence from sexual intercourse will be clearly indicated.

If subacute ovaritis be considered to be the *primum mobile* of this disorder, our efforts should be directed to attempting to relieve this.

If endometritis be regarded as the exciting cause, we should endeavor to remove this condition. For this purpose, leeches to the os uteri have been suggested, together with various applications to the interior of the uterus, such as the fused sulphate of zinc points, nitrate of silver, either the solid stick or a strong solution, iodine, bromine, chromic, carbolic, or nitric acid, iodide of mercury, etc. If any displacement of the uterus be detected, it should, if possible, be obviated.

Whatever views we may entertain, however, as to the pathology of the affection, one indication is evident, and that is the relief of the violent pain. This may be speedily accomplished by means of the hypodermic injection of morphia, or by the inhalation of a few whiffs of chloroform or sulphuric ether, or of a few drops of nitrite of amyl; but as these expedients require medical supervision, we should be careful to remember that the oft-recurring demand for their administration may prove a severe tax upon the time of the practitioner, and encourage a habit that may be difficult to check. Chloral, Indian hemp, opium in various forms, given in the liquor ammoniæ acetatis, injected into the bowel or used as suppositories, may also be resorted to. Dilatation of the cervix uteri, by means of sponge or laminaria tents, may facilitate expulsion of the membrane, but is an expedient that should only be adopted with great care and strict supervision.

General remedies in the form of tonics—quinine, iron, strychnia, arsenic, and the mineral acids—may be tried in the interval.

The bowels should be carefully regulated, and any condition tending to deteriorate the tone of the general health obviated if possible.

Belladonna, given for several days previous to the menstrual flow, in order to get the secondary or dilatory effect, has been recommended and deserves a trial.

Ovarian Dysmenorrhœa.—Any morbid condition of the ovary, such as chronic or subacute ovaritis, is likely to cause a painful or disturbed action of the organ. If in addition to this we have prolapse of the ovary into Douglas's pouch, where its sensitive structure is liable to pressure from accumulated fæces, and to shock from sudden movements of the body, we can readily understand how irritation is kept up and suffering produced. Congestion of the ovary also influences the condition of the uterus, and we frequently notice symptoms due to increased and prolonged hyperæmia and hyperæsthesia of the uterus. In some cases the flow is diminished in quantity, but more usually it is either increased or prolonged, menorrhagia being often the exponent of ovarian dysmenorrhœa. Hysteria in all its numerous protean forms is a frequent accompaniment of this affection, and an attack may often be induced by pressure over the ovarian region. Epilepsy is also in many instances dependent upon ovarian irritation.

Pathology.—Negrier has shown that the ovaries perform alternately, one ovary presenting a recently ruptured follicle, the other

ovary a follicle coming forward, in a less advanced state of development. In women having double uterus and vagina the menses have been observed to come from each side alternately.

In many cases there is distinct thickening of the fibrous coat or indusium of the ovary, or thickening from old adhesions, interfering with the normal dehiscence of the ovule.

In some there is a distinct evidence of vesicular oöphoritis or inflammation of the follicles, while in others there is congestion, swelling, tension of the entire ovarian capsule, producing a kind of strangulation more or less painful in the organ.

Symptoms.—Some few days before the expected appearance of the catamenia, aching pain, varying in intensity in different patients, is experienced in one or other iliac or inguinal region. This has been spoken as “intermenstrual or intermediate dysmenorrhœa.” The pain usually ceases or materially diminishes before the commencement of the flow.

It is of a dull, aching character, persistent not paroxysmal, extending down the inner side of the thighs, and often producing nausea. Nervous phenomena, such as tumefaction of the abdomen, depression of spirits, inequality of temper, and hysterical manifestations, generally concur. The breasts at these times are generally very tender, and occasionally swollen.

It will often be noticed that every other period is worse than the alternate ones, and that the pain is more frequent on one side. This is readily explained on the assumption of the alternate action of the ovaries, and by the fact of one of them being the subject of subacute ovaritis.

Diagnosis.—This must depend partly upon the history, partly upon the rational and physical signs.

The characteristic symptoms have already been given. The physical signs are chiefly pain on pressure over one or other ovarian region, externally and internally as well. If the finger be pressed backwards high up in the vaginal *cul-de-sac* on one or other side, or the uterus be pressed towards the affected side, the pain is experienced. The finger in the rectum often detects the prolapsed, congested, enlarged, and tender ovary even more distinctly than *per vaginam*.

Barnes asserts that a characteristic sign of ovarian congestion is that the body of the uterus is drawn towards the affected ovary in lateroversion, so that the vaginal roof on that side is more tense and full than on the other.

In ovarian dysmenorrhœa the pain is more lateral, and begins some days before the flow, sometimes midway between the periods, and commonly ceases before the flow sets in. In the case of uterine dysmenorrhœa the pain complained of is central, pelvic, and lumbosacral, and does not, as a rule, disappear on commencement of the flow.

The *treatment* of ovarian dysmenorrhœa is not, as a rule, at all satisfactory. Where chronic enlargement of the ovary, with prolapse, has existed for many years, our hopes of affording relief are

very slight. The main points to be attended to are to improve as much as possible the tone of the general health, and to allay local pain. Bearing in mind that the symptoms are apt to recur periodically for many years, we must be very careful not to resort unnecessarily to such agents as opiates, alcoholic stimulants, and anæsthetics. We should rely rather upon such agents as the bromides of potassium, ammonium and camphor, chloride of ammonium, the tincture of Indian hemp, hyoscyamus and camphor.

Where the bromides are tried, they should be given the week before the expected return of the pain, and continued during the period, the dose being gradually augmented from 15 to 20 or even 25 grains thrice daily, if necessary or thought desirable.

The bromide of ammonium is less likely to produce bromic acne than the corresponding salt of potassium; but if this latter be employed, a few minims of liq. arsenicalis tend to counteract the tendency.

In severe cases it may be necessary to combine chloral or morphia with the evening dose, in order to insure repose during the night. The spiritus ætheris and liq. amm. acetatis may often usefully be combined with the bromides.

Should convulsions occur, the inhalation of chloroform may be resorted to.

Locally, depletion by means of leeches has been in some few cases successful, but their employment is attended by many disadvantages, and they should on no account be systematically employed, as they can but tend to produce anæmia and debility, and thus increase the local hyperæsthesia. They may be applied either to the iliac region or at the verge of the anus.

Turpentine stupes, mustard poultices, and blisters have also their advocates, the counter-irritation in some cases affording manifest relief. Vesication by means of chloroform or ammonia is also of service. We should be careful to avoid the possibility of the rectum being loaded, as otherwise the pressure on the inflamed ovary will materially aggravate the discomfort.

Warm hip-baths and vaginal injections, together with rest in the recumbent posture, should be employed for the week preceding menstruation, during the period, and for a few days following.

Opiate suppositories or vaginal pessaries may also be employed.

During the intervals, change of scene and occupation, sea-bathing, a resort to the mineral springs and baths, regular daily out-door exercise, the use of chalybeates and other tonics, may prove of service.

In the event of marriage and impregnation taking place, though sterility is the rule, the nine months' inactivity and repose thus secured to the ovaries may prove of service. It is an expedient, however, that the medical adviser should be careful to avoid taking the responsibility of suggesting.

The question of Battey's operation for extirpation of the ovaries in severe cases of ovarian dysmenorrhœa will be found fully discussed under the Diseases of the Ovaries (p. 273).

CHAPTER XXXI.

LEUCORRHŒA.

THIS term, from λευκός, white, and ρέω, I flow, is generally employed to designate any unusual secretion from the female generative passages, of a whitish, yellowish, or slightly greenish tint, varying in consistency from a thin, milky fluid, to that of a thick muco-purulent secretion, or, in some instances, a viscid gelatinous material like unboiled white of egg. It is often spoken of by patients as "the whites," and has been variously described under the names of fluor albus, blennorrhœa, fleurs blanches, and countless other terms. Although it is merely a symptom of many and various disorders of the female generative organs, and not a primary affection or an essential morbid condition, it will be well to consider briefly the significance of leucorrhœa, and to indicate the usual causes of its production.

Before attempting to enumerate the conditions likely to produce an abnormal discharge from the vagina, it will be well to mention that in a state of health there is a constant secretion of mucus from the whole of the genital tract, but sufficient only to lubricate the parts. The amount varies in different patients and under different circumstances, within strict physiological limits. It is only when the secretion becomes excessive, or annoys the patient by producing irritation externally, that her attention is directed to it, and we are appealed to for treatment.

At the orifice of the vagina we have sebaceous follicles which secrete an oily mucus, as well as muciparous glands which secrete a viscid mucus serving to lubricate the parts. Bartholini's glands secrete a clear viscid fluid having a neutral reaction, resembling somewhat the prostatic fluid, and having a peculiar odor. This secretion is liable to considerable increase during venereal excitement, being discharged in jets during copulation. From the vaginal mucous membrane an acid mucus is secreted, which becomes mixed with large quantities of epithelial *débris*, and presents a somewhat milky appearance. The fundus vaginæ and external surface of the cervix uteri exude a mucus consisting of plasma, containing multitudes of scaly epithelium-cells. From the glands within the cervical canal a transparent viscid alkaline mucus is secreted, forming a glairy albuminous fluid like unboiled white of egg as it exudes from the os uteri, but when mixed with the acid secretion from the vagina the albumen becomes coagulated and a white creamy discharge results. There is also a whitish alkaline mucus from the Fallopian tubes and cavity of the uterus proper, containing columnar ciliated epithelium-cells.

Causation.—Leucorrhœa in some instances may be regarded as

physiological. Thus, just before and after the ordinary menstrual flow, a pale mucous discharge from the uterine cavity is not infrequent. In chlorotic girls we often get leucorrhœa as a substitute for the healthy menstrual sanguineous flow, so that, as Barnes suggests, it may with strict justice be called menstrual leucorrhœa. During pregnancy also, an excessive secretion of mucus often attends the normal hyperæmia, covering the rugæ of the vagina with a white opaque secretion of creamy consistency. Leucorrhœa in many instances may be regarded as a catarrh of the uterine or vaginal mucous membrane, induced by cold or damp. The direct exposure of the patulous vagina to draughts of cold air, from using open privies or draughty w. c.'s, frequently induces leucorrhœa, as also pelvic peritonitis and cellulitis.

Leucorrhœa may be the expression of a constitutional diathesis, such as the strumous or tubercular, the syphilitic, and even the gouty and rheumatic. Anæmia, whether from defective nutrition, prolonged lactation, menorrhagia, any acute or chronic disease, life in town, unhealthy occupations, or other similar conditions, is not infrequently attended by leucorrhœa.

Dyspepsia, more especially if flatulence and constipation exist, is frequently associated with leucorrhœa. It is, however, difficult in some cases to determine which was the antecedent disorder. Leucorrhœa may be an expression of vascular turgescence, the result of difficulties associated with the cardiac, renal, or hepatic circulation. Where constitutional predisposition exists, any slight cause will provoke it, such as walking, excess in coitus, dancing or other exercise.

Vaginitis, simple or specific, is occasionally spoken of as leucorrhœa, and even the watery discharge present in cases of epithelioma. When leucorrhœa is constant, it will usually be found to depend upon some uterine disorder, such as subinvolution, fibroids, polypi, or fungous vegetations, displacements, endometritis, corporeal or cervical granular degeneration, laceration and eversion of cervix, or other form of uterine disease.

Diagnosis.—The state of the general health, the history as to the onset, duration, and character of the discharge, will often enable us to form an opinion as to the nature of the disorder. In chlorotic and anæmic girls, it is seldom requisite to resort to a local investigation; constitutional treatment will generally be sufficient to clear up the diagnosis. In married patients, and where the discharge persists in spite of simple treatment, it is always better to make a vaginal examination.

Dr. Tyler Smith has shown that vaginal leucorrhœa consists of a white creamy-looking fluid, composed of acid plasma, scaly epithelium, pus-corpuscles, blood-globules, and fatty matter, whereas cervical or uterine leucorrhœa consists of a thick, tenacious, ropy secretion, like the unboiled white of egg, becoming denser from admixture with the acid secretion of the vagina, which converts it into a curdy fluid resembling boiled starch.

It is composed of alkaline plasma, mucus-corpuscles, altered

cylinder epithelium, pus-corpuscles, blood-globules, and fatty particles.

Treatment.—The first question that will generally present itself to the practitioner when a patient complains of leucorrhœa, will be the necessity or otherwise of a local examination, and this is by no means unimportant. Much obloquy may be incurred by examining unnecessarily a single patient, and, on the contrary, legal proceedings have before now been instituted, where, in cases of epithelioma, the patient has been treated for months for leucorrhœa, no examination having been made, and the true nature of the disease not discovered until it was too late for any operative interference.

As a general rule it may be stated, never examine single patients until simple remedies have failed, and then only digitally in the first instance, the speculum being employed should the finger detect disease of the os or cervix uteri; always examine married patients where the discharge is persistent, or the symptoms of uterine disease are severe or well-marked.

In strumous, phthisical, chlorotic, and anæmic patients we must first endeavor to improve the tone of the general health, by attending to the digestive organs, regulating the bowels, securing a proper amount of daily exercise, change of air, with sea-bathing, if the season permits, and administering light chalybeate tonics combined with quinine, strychnia, or arsenic. Cold hip-baths and the employment of the vaginal syringe, with lotions containing borax, boracic acid, chloral hydrate, alum, or sulphate of zinc, in the proportion of about one drachm to a pint of water, will generally prove of much service.

When the secretion seems to be chiefly vaginal, and the general health is in fair condition, the employment of hot-water vaginal injections, the patient lying on her back, with her hips raised, will often prove of much service. Having tried this in any case for a short time, and the discharge still persisting, the application of some caustic solution may effectually check the secretion. The vagina having been first well washed out with simple water, as large a tubular speculum as the passage will tolerate is then gently inserted, so as to unfold the rugæ right up to the fundus vaginæ. Half an ounce or more of a strong solution of nitrate of silver, carbolic acid, iodine, or other suitable agent, is then poured into the speculum and allowed to bathe the walls thoroughly as the instrument is gradually withdrawn. When the extremity of the speculum is about one inch from the vulval aperture, the outer end must be tilted down so as to allow the fluid to run out into a porringer, and avoid its coming in contact with the vaginal orifice or running down over the parts externally; a tampon saturated with glycerin is then inserted just within the vagina, and the patient kept in the recumbent position until all inconvenience has subsided.

Where these simple measures fail, or the symptoms demand local exploration, it will generally be found that the leucorrhœa is uterine and not vaginal. In these cases mere vaginal injections

are not sufficient to effect a cure; it will be necessary to apply caustics to the cervical canal, or resort to such other local treatment as the nature of the case may indicate, and which will be found fully described under their appropriate headings. As previously indicated, leucorrhœa should not be regarded as an independent disease, but merely as a symptom of constitutional or local origin. The chief object is to make an accurate diagnosis; this being done, the treatment can be then persistently carried out.

Where the discharge is very acrid and irritating in character, it occasionally happens that much irritation or smarting of the labia and inner surface of the thighs occurs, producing a species of intertrigo or excoriation, which adds much to the patient's discomfort, and demands our assistance. Strict attention to cleanliness, more especially the frequent employment of the vaginal douche or syringe, with some alkaline lotion, such as sodæ biborat. \mathfrak{zj} – \mathfrak{zj} ad aquam Oj, or sodæ carb. \mathfrak{zss} ad aquam Oj, must be had recourse to.

The insertion of a plug of cotton-wool, medicated or not, as the case demands, just within the vaginal orifice, to prevent the discharge running down and irritating the parts, is often of great service.

Where the irritation seems disproportionate to the amount of discharge, we should be careful to ascertain that there is no diabetes present. It has frequently been our lot to detect this condition where it had previously never been suspected.

If a distinct eczematous eruption be present, much benefit will be derived by painting the surface over with a strong solution of the nitrate of silver, \mathfrak{ij} ad \mathfrak{zj} aquam, and the subsequent employment of some sedative lotion, such as camphor \mathfrak{zj} , spir. vini rect. q.s., glycer. boracis \mathfrak{zss} , aquæ rosæ ad \mathfrak{zviij} —M. A small quantity to be used with equal proportion of warm water several times daily. A lotion composed of calamine \mathfrak{zss} , p. zinci oxidi \mathfrak{zj} , glycerin. purif. \mathfrak{zj} , aquæ rosæ ad \mathfrak{zviij} —M., daubed on the surface, often allays the irritation. Dusting the surface over with powders composed of bismuth, camphor, oxide of zinc, and starch, is also very useful.

The application of a coating of flexile collodion to protect the irritated surface in some cases works wonders, enabling the skin to recover its healthy condition.

Infantile leucorrhœa is confined chiefly to the external genitals, rarely extending to the vagina. It occurs not only in infants, but in children of all ages. The sebaceous glands not being as yet developed, the discharge is serous or sero-purulent.

Causation.—This condition most frequently occurs among the neglected children of the poor from want of proper care and attention as regards food, hygiene, and personal cleanliness. It has been known to occur epidemically, and may arise from ascarides in the rectum finding their way into the vagina, the irritation of dentition, cold, irritating substances applied to the part, or mechanical injury, as from attempts at intercourse. Strumous children are especially liable to suffer from it, and it also follows as a

sequela of small-pox, scarlet fever, etc. In children subject to skin diseases (eczema, impetigo, etc.), leucorrhœa is no unusual concomitant.

Symptoms.—At first heat and discomfort, with some amount of itching and irritation, are complained of, with possibly smarting or scalding on passing water.

Later on, a thin, colorless mucous discharge appears, which increases in quantity and becomes thicker and more muco-purulent, often producing much irritation from its acrid character, and occasionally excoriation, or even ulceration or eczematous eruption, on the skin.

In acute cases the pain and irritation rapidly increase, interfering with locomotion and often with rest, the scalding on micturition being often very distressing. As a rule the symptoms subside in a few days, the discharge ceasing entirely, or occasionally becoming chronic.

Where it assumes an epidemic form, the cases are often very severe as well as fatal, being more of an erysipelatous character.

Much smarting and irritation often occur, inducing the child to scratch and rub the parts, thus increasing the irritation and often leading to the suspicion that she has been improperly tampered with. A medical man should be on his guard in listening to any accusation of this nature, and not be misled by statements, suggested it may be by the mother, tending to criminate some one of rape.

Where infantile leucorrhœa is supposed to be the result of an attempt at criminal intercourse, we should be extremely careful in accepting the suggestion even of the one being dependent upon the other. "The presence of this discharge is no proof whatever of such an offence, which *must be proved by evidence totally independent of it.*" (Churchill.) No suggestions should be made to the child in the way of leading questions; but any facts in relation to the supposed occurrence should be carefully noted, such as the presence of blood-stains or those of seminal fluid on the linen, marks of contusion on the vulva, etc.

The chief points to be depended on in such cases in forming an opinion, are the sudden invasion of the symptoms, their severity, the presence of contusion, swelling, ecchymosis, with soreness and other indications of violence having been employed.

Occasionally an eczematous kind of crust forms, and on separation of this a more or less ulcerated surface presents itself, which has at times been mistaken for syphilis.

Where the excoriation is marked or ulceration ensues, adhesion between the opposed surfaces of the labia occasionally results, and if not prevented will ultimately cause occlusion of the vaginal orifice, and may thus interfere subsequently with the escape of the catamenia, or offer an obstacle to coition or parturition. Simply tearing the surfaces asunder, when the adhesion is recent, and keeping them separate by oiled lint, will obviate this difficulty; but, if allowed to continue, an operation will be necessary to remedy it.

Treatment.—Warm fomentations, strict cleanliness, keeping the parts separate, the application of lead lotion, black wash, or a lotion composed of glyc. boracis ʒij, aquæ rosæ ad ʒviij, together with a slight laxative, such as the effervescing citrate of magnesia, syrup of senna, tamarinds, a few grains of pulv. hyd. c. cret. c. rheo, or any simple saline, will generally be sufficient to relieve the milder forms in the early stage; the general health being carefully attended to, the diet simple, all exercise being, as far as possible, prohibited, and precaution taken to avoid irritating the parts by rubbing.

Should the discharge continue and become chronic, we may try lotions of alum. sulph. gr. iv ad ʒj, zinci sulph. gr. ij–iv ad ʒj, or arg. nit. gr. v–x ad ʒj.

The application of the glyc. acid. carbol., or of a strong solution of nitrate of silver (ʒj ad ʒj aquam), will often effect a cure when less severe measures fail. The administration of chalybeate tonics, with careful regulation of the bowels, is generally necessary.

CHAPTER XXXII.

UTERINE HÆMORRHAGE, MENORRHAGIA, AND METRORRHAGIA.

Uterine Hæmorrhage, Menorrhagia, and Metrorrhagia.—Under this heading we shall consider all forms of immoderate or unusual flow of blood from the uterus, including *menorrhagia*, or profuse menstruation, where the ordinary catamenial period is inordinately prolonged, the quantity discharged is excessive, or the interval between the periods is diminished; and *metrorrhagia*, or copious and continuous flow of blood during the interval, not necessarily associated with menstruation, often described by patients as flooding, and occurring so irregularly that no monthly periodicity can be detected.

When we remember that of all the organs in the body the uterus is the only one from which blood flows as a physiological process, we shall not be surprised to find that this function is influenced by many and various causes both general and local, and is often a symptom of the most varied affections. Hæmorrhage must not be regarded as a disease or entity *per se* for which one method of treatment is universally applicable, otherwise we shall fail in our efforts to afford relief. Nor must we regard hæmorrhage from the uterus as an invariable evidence of disease, for it may be merely an expression of constitutional or general vascular tension, the uterine mucous membrane acting, so to speak, as a safety-valve, a smart attack of hæmorrhage often serving to avert a still more serious effusion from the ovary, or its surrounding plexus, into the peritoneum, or even an attack of apoplexy at the so-called climacteric period, the uterine hæmorrhage being beneficial and often affording us a useful hint as to treatment.

In order that we may arrive at some rational explanation of the cause, it is essential that we have some classification that shall include all the more important pathological factors which are the source of excessive or prolonged uterine hæmorrhage, and however arbitrary such classification may be, it will materially assist us in our task. Dr. Thomas, in his admirable work on "Diseases of Women," gives the following, which may well be quoted as an example of conciseness, affording as it does at a glance the ordinary causes producing uterine hæmorrhage, any one of which may be sufficient to account for the flow, though it does not necessarily follow that two or more of the conditions may not be present.

Causes of Uterine Hæmorrhage (Thomas).

<i>Congestion of uterine tissue may be due to</i>	{ Areolar hyperplasia. Subinvolution. Fibroids. General plethora. Displacement. Fæcal impaction. Chronic ovaritis. Laceration of the cervix. Ulceration.
<i>Solution of continuity may be created by</i>	{ Granular degeneration. Cancer. Sarcoma. Laceration of the cervix. Polypi.
<i>Growths from uterine walls may consist in</i>	{ Fungous growths. Adhering products of conception. Fibroids. Sarcoma or cancer. Scorbutus.
<i>Blood dyscrasia may be due to</i>	{ Chlorosis. Spanæmia, from uræmia or other grave constitutional disease.

Other authors have endeavored to classify the various exciting causes under the heads of General and Local. There are certain advantages in this method sufficient to warrant us in briefly alluding to them.

General Causes of Uterine Hæmorrhage.

<i>Cerebral.</i>	{ Mental worry, distress, shock, etc. Long-continued mental depression. Emotional influences.
<i>Cardiac.</i>	{ Mitral and other valvular diseases, such as insufficiency and stenosis of the mitral valves, leading to hypertrophy, dilatation, etc. Fatty degeneration.
<i>Lungs.</i>	{ Pneumonia, bronchitis, emphysema, phthisis, etc., where dyspnoea or œdema dispose to uterine congestion.
<i>Liver.</i>	{ Tropical diseases; congestion from alcohol, more especially about the climacteric, with general plethora from high living and indolent habits; acute atrophy.
<i>Kidney.</i>	{ Albuminuria; Bright's disease.
<i>Spleen.</i>	{ Ague; malaria from residence in damp or marshy districts.
<i>Ovarian.</i>	{ Excess in coitu; ovaritis.
<i>Visceral.</i>	{ Constipation; hæmorrhoids; large abdominal tumors, by obstructing the return of blood through the vena cava.
<i>Exanthemata.</i>	{ Variola, rubeola, etc.
<i>Blood-disease.</i>	{ As in cholera, typhus, scurvy, lead-poisoning, leucocythemia, hæmophylia, etc.
	{ Excessive lactation and other debilitating influences. First establishment of catamenia; climacteric.

It would answer no useful purpose to attempt to enter minutely into the various general causes of uterine hæmorrhage. The mere statement of them will be sufficient to direct the practitioner's attention to the possibility of one or more of them proving an exciting cause, more especially if, on examination *per vaginam*, no well-

marked uterine disorder be detected. The condition of the heart, liver, and kidneys should in all cases be carefully investigated, for even if some local uterine cause exist, the state of the organs mentioned may exert a marked influence in keeping up or intensifying the uterine hæmorrhage.

Differentiation.—Uterine hæmorrhage, being merely a symptom of so many and different conditions, it is of course very important to endeavor to ascertain what are the predisposing and exciting causes in the individual case under consideration. This is often extremely difficult, but none the less must be attempted, as, unless we have some rational idea of the probable cause, we shall not only fail in our efforts, but may possibly aggravate the symptoms we are endeavoring to relieve.

If any condition of the system generally, such as we have indicated in the list of general causes, be evident, our efforts must be first directed to remedy this. Should we not succeed, it will then be advisable to investigate carefully and systematically the condition of the pelvic organs, bearing in mind the several local causes mentioned as likely to occasion hæmorrhage.

The uterus itself must be examined digitally by conjoined manipulation, by the aid of the uterine sound, provided there be no suspicion of pregnancy, and by the speculum. The condition of the pelvic contents must be carefully ascertained by the several means previously indicated.

If on examination the cause of the hæmorrhage seems to be intra-uterine, it may be necessary to dilate the cervix uteri by means of laminaria or sponge-tents, and then examine thoroughly the interior by the aid of the finger, the uterine sound, or the curette.

Treatment.—This of course will depend upon the supposed cause of the hæmorrhage, and will be palliative or curative as the case may be.

It is not always advisable to attempt to check the flow at once, unless it is producing such an effect upon the system generally as to suggest the expediency of arresting it at all hazards. In certain cases of heart disease, profuse menstruation in place of aggravating seems to relieve the cardiac symptoms, and should not therefore be hastily repressed. Digitalis and aconite, by depressing the heart's action and diminishing the frequency of the pulse, relieve hæmorrhage in these cases more than any other remedies.

Tinct. digitalis in $\mathfrak{m}x$, or infusum digitalis \mathfrak{zss} – $\mathfrak{3j}$, alone or combined with ammonia, salines, or chalybeates, as the case may indicate, may be given thrice daily, carefully watching the effects.

Tinct. aconiti in \mathfrak{mij} – v doses, repeated every four to six hours until the pulse is influenced in frequency, is sometimes of service.

Veratria and belladonna have also been recommended.

Where the action of the liver seems to be at fault, a few grains of calomel on the tongue, or a blue pill followed by a brisk saline aperient, such as mag. sulph. $\mathfrak{3ij}$ – iv , with $\mathfrak{m}xv$ – xx of acid. sulph. dil., or a Seidlitz powder, or half a tumblerful of any of the aperient waters, such as the Friedrichshall, Hunyadi Janos, Pullna, etc.,

will probably prove of service, together with a properly restricted diet and abstinence from all rich dishes and fermented liquors for a time. The action of the skin should be promoted, and any other indications suggested by the nature of the case followed up.

If there be any trace of albuminuria, or the kidneys seem to be at fault, encourage vicarious action of the skin and bowels by means of diaphoretics and purgatives, as liq. ammon. acet., pulv. jalapæ co., mag. sulph. c. ferri sulph., and give in addition digitalis and iron, ergot or nux vomica, gallic acid, etc.

If malarial poisoning be suspected, examine carefully the condition of the spleen, and give quinine or arsenic, or such other remedies as the case may indicate.

Where ovarian irritation seems to be the exciting cause of uterine hæmorrhage, much benefit may be derived from large doses of bromide of potassium or ammonium, camphor, cannabis indicæ, conium, hyoscyamus, belladonna, and other agents of this class.

Dr. Meadows has recently called attention to a fact well known to gynecologists, that the ovary dominates the functions as well as influences the diseases of the uterus. He says, "Menorrhagia, amounting it may be to a positive hæmorrhage, may result simply from ovarian activity, and be the direct consequence of morbid and excessive ovarian action.

"Pain to a greater or less extent, as a general rule, is a constant feature in these cases, situate in one or other ovarian region, more frequently the left. This ovarian pain extends upwards along the spermatic plexus to the renal region and above that, under the ribs of the corresponding side to the mamma, which often becomes very painful and even tender to the touch.

"The uterus in these cases is found to be perfectly healthy. On deep and firm pressure over the inguinal region, and internally *per vaginam* by means of the finger, the ovary will be found to be swollen, very tender to the touch, and often prolapsed, the pain and distress being aggravated by pressure. Thirty grains of the bromide of potassium, and one drachm of the syrupus ferrid bromidi, thrice daily, combined occasionally with the iodide of potassium or the iodide of iron, are the best means of controlling this particular form of menorrhagia.

"Locally, a pessary containing one grain of the alkaloid conia, and one-twelfth of a grain of atropine, inserted into the vagina every night, allays pain and calms vascular excitement."

In cases of blood-dyscrasia, the treatment applicable to the several conditions should be resorted to. In scurvy—lime or lemon juice. In lead-poisoning—pot. iod., acid. sulph. dil., etc.

In hæmophylia—large doses of iron, ergot, and oil of turpentine. In chlorosis—iron, phosphorus, strychnia, etc.

Where menorrhagia seems to result from excessive lactation, this must be obviated and the general health improved by tonics. Where the so-called terminal floodings occur at the period of sexual involution, towards the climacteric or change of life, there is a cer-

tain amount of danger in stopping the critical flow too soon, particularly in those who are plethoric, or who have been accustomed to lose much blood at the menstrual periods, as otherwise apoplexy may result. A few grains of calomel or blue pill, followed by saline purgatives, will often prove beneficial, and then other measures should be adopted as the nature of the case may suggest. Mineral acids with bark, or quinine, or arsenic, generally prove of service. Others are benefited by gentian and alkalies, or salines, such as the carbonate or tartrate of soda, chloride of ammonium, bromide of potassium, etc.

Local Causes of Uterine Hæmorrhage.

Uterine congestion; inflammatory engorgement and hypertrophy; subinvolution.

Uterine displacements and flexions.

Ulceration—granular, cancerous.

Polypus—mucous and fibroid.

Fibroid tumors.

Fungous degeneration of uterine mucous membrane.

Hæmatocele; extra-uterine fœtation.

Retained products of conception; moles.

Hydatidiform degeneration of the villi of the chorion.

Inversion of uterus.

Wounds from accidents, as in laceration of cervix from parturition, operations, leech-bites, etc.

Carcinoma, epithelioma.

Local Treatment.—If uterine congestion or inflammatory engorgement be present, the application of a few leeches, four to six, to the cervix uteri, or puncturing with a lancet-shaped knife so as to extract four to six ounces of blood, placing the patient in a warm hip-bath, or injecting copious streams of warm water through the speculum to encourage the bleeding if necessary, will often arrest hæmorrhage that has continued for many weeks.

The internal administration of ergot or nux vomica with tinct. cinchonæ; or small doses of liq. hyd. perchl. in combination with either of the latter, will then probably assist in relieving the congestion and checking further hæmorrhage. Bromide of potassium (gr. xx—xxx) is also useful in these cases.

Attention should also be directed to regulating the bowels, ensuring physiological rest, and improving the general health.

Where subinvolution occurs, although the patient may appear anæmic, iron should be avoided. Bromide of potassium, ergot or nux vomica, and acid. nitric. dil., with some preparation of bark, should be given, and the patient enjoined to rest up the greater part of the day.

In these cases there is generally some granular degeneration of the cervical mucous membrane. The application of strong carbolic or nitric acid by the aid of a Playfair's probe to the cervical

canal will relieve this condition, and also stimulate the uterus to further contraction. Care must be taken to discriminate between granular erosion and laceration of the cervix.

Where uterine displacement, either version or flexion, seems to be an exciting cause of hæmorrhage, this should be remedied by the insertion of a suitable support, and enjoining rest in the prone or supine position, according to the nature of the case, leeches being applied or puncturing or scarification resorted to if necessary, or nitric acid employed if there be a granular condition of the cervix.

Where the so-called granular ulceration, more strictly speaking granular degeneration, of the mucous membrane covering the os and lining the cervix uteri is detected, the appropriate treatment, as elsewhere indicated, must be followed.

In epitheliomá of the cervix uteri, severe hæmorrhage is a common symptom. The only method of arresting this is by local applications, which destroy the surface of the diseased tissue. If the speculum be used it must be passed with extreme care, as otherwise increased hæmorrhage will be excited. The best agents are the strong nitric acid, potassa fusa, perchloride or persulphate of iron, the galvano-cautery or ferrum candens.

Where we have the cauliflower excrescence or vegetating epithelioma to deal with, it is often advisable to amputate the lower portion of the cervix and then apply the actual cautery, or even gouge out still more of the diseased tissue by means of Simon's scoop, and then plug the cavity with a little cotton-wool, soaked in a saturated solution of alum or a small quantity of liq. fer. perchl. fortior, and squeezed as nearly dry as may be; another tampon, soaked in glycerin, being then passed to protect the fundus of the vagina.

If a polypus be detected as the cause of hæmorrhage, it must be removed either by excision, torsion, and traction, or by the *écraseur* or galvano-caustic wire, as indicated under the section devoted to Polypus Uteri.

Where fibroid tumors are diagnosed their treatment requires special care, and, as a rule, none but an experienced gynecologist should attempt it, for the risk to life is often great, and very much depends upon an experienced judgment in deciding what steps should be taken.

Gallic acid with ergot or nux vomica, and cinchona, and subsequently some of the styptic preparations of iron, may often prove of much service in arresting hæmorrhage until skilled assistance can be procured.

Where fungous degeneration of the uterine mucous membrane is suspected or recognized, it will be necessary to dilate the cervix in order to ascertain clearly the presence and extent of this condition either by the aid of sight or touch.

The curette of wire, without cutting edge, may then be employed to scrape carefully the surface of the uterine mucous membrane, wherever this diseased condition may be found to exist.

We need scarcely say that it is not an operation to be lightly performed, nor unless we have ascertained distinctly that there is really a fungous condition present.

If there be any doubt about it, or if the practitioner has not a curette at hand, it will be safer to swab out the interior of the uterus with the strong nitric or carbolic acid, strong tincture of iodine, solution of nitrate of silver or perchloride of iron, taking care to guard carefully the vagina from any excess of these agents running down and setting up irritation.

Where a hæmatocele is detected, the appropriate treatment will be found under this heading. If extra-uterine gestation be suspected we cannot be too careful in our manipulations, for fear of rupturing the cyst.

Where, subsequent to a miscarriage or a confinement, we have reason to believe that some retained product of conception is present, our first care must be to dilate the cervix, unless this be already sufficiently patulous, in order to allow of the expulsion of any such portion, and then by means of the finger, ovum-forceps, or sound, displace it from its attachment if necessary, or inject carefully some antiseptic fluid with a view to washing out the *débris*. Swabbing out the interior of the uterus with the liquor ferri perchlor. or other agent, as mentioned in cases of fungous degeneration of the mucous membrane, is sometimes sufficient to check further hæmorrhage and to stimulate the uterus to expel any retained product, this object being further attained by the internal administration of ergot. The subject will be found fully considered under the head of Subinvolution (p. 183).

The same treatment is applicable for uterine moles. Where hydatidiform or cystic degeneration of the villi of the chorion be detected, the os and cervix uteri must first be dilated by means of tents or Barnes's bags, and then, having roused the uterus into expulsive action by means of ergot, the finger or scoop or ovum-forceps should be inserted and the removal of the mass effected, the process being assisted by pressure externally on the fundus uteri.

Where inversion of the uterus is the cause of excessive hæmorrhage, our first object should be to endeavor to reduce the inversion. If we cannot succeed in this, in order to arrest the hæmorrhage a long strip of calico or linen about one inch wide, saturated in some strong astringent, such as the tincture of iron, solution of alum or tannin, may be wound tightly round the protruding organ, or iced water injected, or pressure applied until further means can be devised for endeavoring to reinstate the uterus in its normal position. Amputation should only be resorted to as a last expedient.

It occasionally happens that continuous hæmorrhage occurs *post partum*, the uterus being firmly contracted. On examination, some laceration of the cervix will generally be found. A large Fergusson's speculum should be passed, and, if any bleeding vessel can be detected, an attempt may be made to seize it by means of

torsion-forceps and twist it until the hæmorrhage ceases. Failing this, a dossil of cotton-wool steeped in liquor ferri perchlor. may be pressed firmly into the bleeding aperture and held there, or should this fail, it may be necessary even to apply the actual cautery.

A lump of ice passed up to the cervix and retained there will occasionally prove sufficient, and should in any case first be tried before resorting to more severe measures.

The same treatment would apply to injuries from operations.

Where the bleeding from leech-bites is continuous and cannot be checked by means of ice, a speculum should be passed and the punctures touched with arg. nit., ferri perchlor., or the point of a red-hot knitting-needle.

The treatment of hæmorrhage from carcinoma or epithelioma has been given under Cancerous Ulceration.

If uterine hæmorrhage be very profuse and no assignable cause for its production can be detected, it may be requisite to arrest the flow as rapidly as possible. Rest in the horizontal position must be enjoined, the pelvis being raised beyond the level of the shoulders if necessary. All tight-fitting garments should be removed, no hot drinks nor alcohol given, except to avert fatal syncope. Ergot in ʒss doses or even ʒj should be given every hour for three doses, and then as often as considered prudent. If difficulty be experienced in giving it by the mouth, the hypodermic syringe may be employed the sclerotic acid being best. Digitalis in ʒxv – xx doses of the tincture, or ʒj – ij of the infusion, may be given in conjunction with the ergot or alone. Strychnia gr. $\frac{1}{24}$ – $\frac{1}{12}$ and quinine in gr. v–x or xv doses may be tried. The ext. cannabis indicæ gr. ss–j is often of service where pain is also present. The bromide of potassium gr. xx–xxx is indicated where ovarian irritation coexists. The hot-water vaginal douche, 110° to 115° F., may be employed, or to the interior of the uterus if the cervix be previously dilated. The shock of cold sponging is sometimes of service. If these means fail, the better plan will be to pass a speculum and insert a laminaria or sponge-tent into the cervix, so as to plug the os and at the same time dilate the cervix, so as to facilitate exploration.

Plugging the vagina is a very unscientific proceeding, as well as very objectionable, and should never be trusted to. If the hæmorrhage recurs on removal of the tent from the cervix, the interior of the uterus must be swabbed out with the tincture of iodine, tincture of iron, or other astringent, and, failing this, an intra-uterine injection must be resorted to, but only under the conditions mentioned when speaking of this method (p. 170).

Practically, except in connection with abortion or pregnancy, it is but rarely that we meet with severe cases of flooding the cause of which cannot be ascertained, and the case dealt with in accordance with certain rules. Still, instances of menorrhagia ending fatally have occurred in which no evidence of any morbid condition could be detected even on a careful post-mortem examination.

Hæmorrhages connected with Pregnancy.—Abortion, placenta pre-

via, partial detachment of placenta, so-called accidental hæmorrhage, retained placenta or clots, placental or fibrinous polypus, hydatidiform degeneration of the villi of the chorion, extra-uterine gestation, varix of the vulva or vagina, granular degeneration of the mucous membrane of the cervix, producing the so-called menstruation of pregnancy, and partial or complete inversion of the uterus, are the principal conditions met with.

They are only enumerated here for the guidance of the practitioner. A detailed consideration of all of them would take us beyond the scope of the present work. Many of them will, however, be found described under their appropriate headings.

CHAPTER XXXIII.

STERILITY.

Sterility.—Sterility, barrenness, or infecundity, are the terms applied by different authors to designate the condition of incapacity for conception, or where the ovum does not advance to maturity. The subject itself is one of great importance, and has occupied the attention of writers from the earliest ages down to the present time. Not only has it been held to be a reproach to women, but there is no doubt that sterility is the cause of much unhappiness in married life. Apart from this, however, the perpetuation of names and families, the descent of property, and even the permanence of dynasties and governments, may depend upon the fact of sterility being curable or otherwise.

The question of a woman's being probably sterile is decided within the first three years of married life. Only 7 per cent. of the fertile bear first children after three years of marriage, or about one in fourteen.

A certain number of women in every community will be found to be sterile. Among 495 marriages in the British peerage, 81 were unproductive, or 1 in $6\frac{1}{5}$ were without any family; that is about 17 per cent. Of 675 marriages among the agricultural and seafaring, 65 were sterile, or about 1 in 10. The evil influence of consanguineous marriages may help to explain these figures.

It has been computed that in Great Britain alone there are over 500,000 married females sterile, and, as Dr. Bennet remarks, it is difficult "to believe that mere physiological or pathological deficiencies, either on the female or the male side, in a function which lasts during the greater part of our existence, can satisfactorily account for such a result."

Sterility does not necessarily prove that the sexual organs or functions in either the male or the female must be in an abnormal condition. There may be a physiological incompatibility, a relative not an actual sterility, as proved by husband and wife living together for many years without having any family, and without apparently any alteration in the condition, pregnancy ensues. Again, a wife remains sterile with one husband who has had children by his former wife, and yet conceives at once on marrying again after the death of her first husband. Instances are not unknown of "man and wife living together for years, having no family, being divorced, marrying again, and having families, without apparent change in their health, before or after the divorce."

Probably many of these anomalies and apparent inconsistencies are often merely the result of latent disease and of morbid local conditions, and, as such, susceptible of being explained and remedied.

The fact should not be forgotten that although a woman may be actually sterile, she may be potentially fertile, conception not taking place from the absence of healthy living spermatozoa on the part of the husband to impregnate the ovum. It has been proved conclusively that men in robust health, where impotence is out of the question, the sexual act being perfectly accomplished, may have no living spermatozoa in their spermatic fluid. This may be due to some congenital defect, or as a result of some antecedent inflammatory condition of the testes, notably from orchitis, the sequel of gonorrhœa. That syphilis in the male does not necessarily cause sterility is proved by the frequent occurrence of congenital syphilis in the infant, but the case is different with gonorrhœa. The active stage may have subsided, but there may still remain a chronic or latent gonorrhœa sufficient to cause a persistence of morbid secretion in some part of the urethra or vasa deferentia, which being mixed with the semen at the time of ejaculation, acts as a direct poison on the spermatozoa.

It has been demonstrated that of eighty-three cases of bilateral epididymitis, only eight had afterwards spermatozoa in the semen, due probably to obliteration of the vasa deferentia or epididymis. About 90 per cent. of sterile women are married to husbands who have suffered from gonorrhœa either previous to or during married life. The inference, therefore, is clear that before resorting to any active treatment of the female for sterility, we should endeavor to ascertain whether the secretion from the male is healthy in character and contains living and active spermatozoa.

That connection should be pleasurable is a sign of the reproductive organs being healthy, but sensual gratification is not necessary to conception, nor does its absence preclude conception. Occasionally we find instances where too intense passion and too frequent intercourse seem to be the only barrier to fertility. The employment of cold hip-baths and the administration of anaphrodisiacs, such as camphor, bromide of potassium, etc., may here be tried; together with separation for a time. The opposite condition, frigidity, although in some cases it may point to absence or imperfect development of the ovaries or other portion of the sexual apparatus, is not necessarily associated with sterility. Numbers of wives become mothers who have even a positive aversion to the sexual act, and where not the remotest sensation of pleasure is experienced at those times, there being a complete absence of sexual feeling.

Diagnosis.—Whenever we are consulted in a case of sterility, the patient generally has an idea that it is due to some defective development or mechanical impediment, and therefore comes prepared to submit to a careful investigation. This should always be made, both for the patient's satisfaction as well as for our own credit.

Having first listened attentively to any statements or opinions that may be offered, we should make particular inquiries as to the catamenial functions; time of first appearance, regularity or

otherwise, duration of flow, interval between the periods, presence or absence of pain, character of pain if present, as to when it commences, how long it lasts, what seems to relieve it, whether it recurs at each period or only occasionally; and any other questions that the nature of the case may suggest or our inquiries may bring forth.

Ascertain distinctly whether the patient is subject to vaginal discharge, its nature and amount, when most profuse and whether habitual or only occasional.

Physical Examination.—Observe carefully whether there seems to be any undue sensitiveness of the vulval outlet on attempting to explore the vagina with the finger, as met with in vaginismus.

Note the character of the hymen, whether imperforate, cribriform, fleshy, cartilaginous, or merely represented by the carunculæ myrtiformes. Ascertain the condition of the vagina—whether normal in character, constricted, double, long or short, small or capacious.

As to the uterus, satisfy yourself as to its presence, its position, whether ante- or retro-verted or flexed, prolapsed, or drawn up out of the pelvis; whether it be enlarged as by fibroid, congested or inflamed, indurated, softened, or atrophied, whether it is mobile or fixed; note the condition of the cervix, whether infantile or conical, hypertrophied or elongated, granular or ulcerated. Is the external os uteri pin-hole? will the uterine sound pass readily, or is there stricture of the cervical canal or spasm of the internal os, or a small polypus blocking up the canal? Ascertain, if possible by conjoined manipulation, whether the ovaries can be felt, and whether they appear to be normal in size, character, and position. Can any thickening or deposit of any kind be detected in the pelvis likely to interfere with the function of the ovaries or Fallopian tubes? Is there any undue secretion in the vagina likely to interfere with the vitality of the semen? Is the cervix uteri pouring forth any viscid glairy mucus that would be liable to prevent the passing of the semen up the canal? All these several points should be noticed. We shall frequently find one or more of the conditions indicated present, even if they may not prove to be the cause of the sterility.

Dr. Marion Sims, who has devoted much attention to the subject, and has published some most interesting clinical notes on uterine surgery with special reference to the management of the sterile condition, lays down the following as postulates embracing the general principles or laws most favorable, indeed, essential, to fecundation:

1. Conception occurs only during menstrual life.
2. Menstruation should be such as to show a healthy state of the uterine cavity.
3. The os and cervix uteri should be sufficiently open to permit the free exit of the menstrual flow, and also to permit the ingress of the spermatozoa.
4. The cervix should be of proper form, shape, size, and density.

5. The uterus should be in a normal position, *i. e.*, neither anteverted nor retroverted to any great degree.

6. The vagina should be capable of receiving and of retaining the spermatic fluid.

7. Semen, with living spermatozoa, should be deposited in the vagina at the proper time.

8. The secretions of the cervix and vagina should not poison or kill the spermatozoa.

Although in the majority of cases in which we are consulted, where no children are born within the first year or two of married life, the female generative organs are presumably in a normal condition, there being no impediment to coition, no unusual discomfort, nor severe local symptoms complained of, it will be well to enumerate, for the guidance of the practitioner, the various conditions that have from time to time been met with as offering, so to speak, mechanical obstruction to the admission of semen into the uterus.

Imperforate Hymen.—In some cases, in place of the annular fleshy ring surrounding the entrance to the vagina, we find a dense, firm, fleshy membrane, which prevents alike the exit of the menstrual fluid or the entrance of the male organ. If advice has not already been sought for the amenorrhœa, the probabilities are that it will have been for the dyspareunia or inability to effect intercourse.

In other cases the hymen is cribriform, or perforated by small apertures which allow of the exit of the menstrual secretion and even occasionally of the entrance of semen, but prevents perfect intercourse being effected.

Patients who marry late in life often present a dense, almost cartilaginous condition of the hymen, which, though it interferes with coitus, does not necessarily prevent impregnation taking place, instances being not infrequent where operative procedures have to be resorted to in order to allow of parturition being accomplished.

Atresia vaginæ, literally imperforate vagina, from occlusion or obliteration of the canal, may be either congenital or acquired by some accidental injury or disease. It may be partial or complete. Operative interference is generally requisite, but should only be resorted to after careful consideration.

Double vagina, with or without double uterus, may be mentioned as a rare cause of sterility, one passage ending in a blind *cul-de-sac*, the other formed by a longitudinal septum leading up to a well-formed uterus.

Division of the septum, so as to throw the two vaginæ into one, would probably be advisable.

Vaginismus, or spasmodic contraction of the sphincter vaginæ from extreme hyperæsthesia of the vulval outlet, is not only a cause of dyspareunia, but also frequently entails sterility from the impossibility of intercourse being tolerated. The subject is fully considered under the head of Dyspareunia. In some cases the vagina itself is very irritable, or may be too short or shallow, or there may be gaping of the vulva, or the vagina may have become

stretched into the form of a pouch extending up behind and above the os uteri, all of which conditions interfere with the normal retention of the spermatic fluid, or with its passage into the cervical canal, and are thus indirect causes of sterility.

Absence or Imperfect Development of Uterus.—Complete absence of the uterus is a condition very rarely met with, though it is not infrequent to find a mere rudimentary development. In the event of our not being able to detect the presence of a uterus by conjoined manipulation, one finger being passed *per vaginam* and the other hand pressed firmly down on the abdomen just above the pubes, it will be well to examine *per rectum* in order to determine whether there is any thickening of tissue corresponding to the ordinary position of the uterus. Should we not succeed in this, it will be well to pass a sound *per urethram* into the bladder, and if the finger passed *per rectum* fails to detect the presence of any thickening intervening between the digit and the sound when this latter is moved from side to side, we may fairly conclude that the uterus is absent or so rudimentary as hardly to be worthy of the name of a uterus. Sterility of course is here absolute.

Enlargement of the uterus from chronic hypertrophy, called by some areolar hyperplasia, by others chronic inflammation and chronic infarctus, is a condition very frequently met with among *puellæ publicæ*, and may in some part explain the noted infecundity of this class. It is reasonable, therefore, to infer that where this condition is present, and the patient is sterile, the two are associated as cause and effect. Congestion of the neighboring vessels, as well as those of the uterus, proves alike unfavorable to healthy ovulation and to the normal development of the ovum within the uterus.

Stricture of the cervical canal, more especially of the os internum, is by many regarded as a frequent cause of sterility, but where there is no acute angle of flexion and the menstrual fluid is discharged without difficulty, it is a question whether the mere fact of not being able to pass the uterine sound without producing spasm at the internal os uteri, is a sufficient warrant for dividing the cervix in the heroic way that was at one time recommended, more especially when the fact remains that the sterility often persists after the constriction has been entirely removed.

In cases of sterile women who have been married some years, and where no other apparent cause for their sterility can be found beyond the condition we are considering, it will be well to dilate carefully the cervical canal before resorting to any more formidable procedures.

This may be done in several ways, as described when speaking of malformations of the uterus.

Conical Cervix.—A conical shape of the vaginal portion of the cervix, with a so-called pin-hole os uteri, is a frequent cause of sterility, in fact is regarded by some authorities as being, with the exception of endometritis, the most common of all the causes, and fortunately one of the most remediable, in that it can be rectified

by simply incising the os uteri bilaterally and thus enlarging the aperture, care being taken to prevent the margins of the incision healing again by first intention.

A variety of this condition is met with where the lower portion of the cervix uteri is small and somewhat infantile in character, the os uteri itself being correspondingly contracted. Galvanic stems are here indicated.

Hypertrophic elongation of the cervix uteri, where the os projects almost to the vulva, and in some cases even beyond this, giving rise to the supposition that the uterus itself is prolapsed, and in some instances having been mistaken for the penis, is almost sure to produce sterility. Amputation of the cervix by means of the *écraseur*, galvano-cautery, or by the knife, is the only plan to afford relief.

Polypus uteri, whether so small as merely to offer an obstacle to the ingress of the spermatic fluid, without interfering with the egress of the menstrual fluid, or so large as to cause marked distress from menorrhagia, etc., may produce sterility by interfering with impregnation or by causing expulsion of the ovum at a very early stage should impregnation occur.

Removal of the polypus must be effected by torsion, the *écraseur*, the galvano-cautery, or excision, as may be deemed advisable.

Fibroid tumors of the uterus not infrequently cause sterility, more especially when they are situated close beneath the uterine mucous membrane, and produce a closure or narrowing of the upper portion of the cervical canal.

It is not, however, merely by their mechanical hindrance to impregnation that they produce sterility. Their presence in the uterus keeps up a constant congestion of the mucous membrane, as evidenced by the frequent attacks of menorrhagia, which serves to wash away the ovum, so to speak, before it is firmly attached, before, in fact, conception has taken place. Removal by operative measures can be carried out in many of these cases, but should never be attempted except by those experienced in uterine surgery, for the operation is often difficult and attended by much danger.

Membranous dysmenorrhœa, where the lining mucous membrane of the uterine cavity becomes exfoliated *en masse*, instead of as usually in small disintegrated shreds, is generally attended by such an amount of spasmodic uterine action during the expulsion of the membrane, as to effectually prevent the fixation of the ovum. Sterility of course results. It may be well to mention that the discomfort produced at these times is often so great as to lead to the supposition that an early miscarriage has taken place. A microscopic examination of the product expelled will alone enable us to recognize the nature of the case.

Epithelioma of the cervix, although it may in some instances interfere with the passage of the spermatic fluid into the cavity of the uterus, either mechanically or by the discharge proving prejudicial to the vitality of the semen, cannot be regarded as a frequent cause of sterility, although it is mentioned by some authors.

Even if recognized, it would hardly be deemed a prudent thing to amputate the cervix, so as to increase the probabilities of the patient becoming a mother.

A case has been reported where the cervix was amputated at about the fourth month of utero-gestation for epithelioma, where the fact of pregnancy was not even suspected. The patient nevertheless went to her full time.

Uterine displacements are accountable for numerous cases of sterility. If partial prolapsus be present, it does not necessarily prevent impregnation, although the original congested condition of the uterus, which too often produces a tendency to prolapse, may itself be the chief cause. In any case, the insertion of a Hodge's pessary will prevent the uterus descending, and also favor the return to a normal condition of the organ.

Retroversion of the uterus is a frequently overlooked cause of sterility. When reclining on the back, the fundus being directed to the cavity of the sacrum, the cervix naturally is tilted upwards under the pubes. When coition occurs, the semen gravitates to the lower or posterior fornix of the vagina, where under ordinary circumstances it remains until the patient assumes the upright position, when it becomes expelled. In order to overcome this difficulty, if precautions be taken to prevent the semen escaping from the vagina, and the patient then assumes the knee-shoulder position, the fundus, unless fixed by adhesions, falls forwards towards the abdominal cavity. The cervix then occupies the lowest part of the vaginal *cul-de-sac*, and thus affords an opportunity for the entrance of the semen into the cervical canal. That this is no mere theoretical, unpractical suggestion, abundant evidence could be cited, patients suffering from retroversion who had not hitherto become pregnant after many years of married life, by resorting to this expedient have succeeded in overcoming the impediment to maternity.

Lucretius two thousand years ago wrote :—

Nam more ferarum
Quadrupedumque magis ritu plerumque putantur
Concipere uxores, quia sic loca sumere possunt,
Pectoribus positis, sublati semina lumbis.

Where other means fail, it may be well to remember this suggestion, and where science cannot succeed in affording relief, art may legitimately be resorted to with a view to overcoming sterility.

In some cases where the retroversion is not very marked, nor the uterus very bulky nor tender, but is mobile and otherwise normal, the insertion of a Hodge's pessary will often rectify the malposition, raising the fundus, and thus bringing down the cervix, so that it comes in contact with the spermatic fluid when this latter is deposited in the vagina.

The mere presence of a well-adjusted Hodge offers no impediment to coition ; it is quite unnecessary to remove it on these occasions.

Should impregnation occur, it will still be advisable to retain the Hodge for the first few months of utero-gestation, until the uterus has ascended somewhat, and there is no further risk of its becoming impacted in the pelvis, as not infrequently happens where a pregnant uterus becomes retroverted during the early months.

Lying in the prone position, or adopting the knee-shoulder position from time to time, should be remembered in all cases of retroversion.

Retroflexion of the Uterus.—The axis of the cervix being fairly normal, but that of the fundus being more or less at a right angle to this, stricture at the angle of flexion occurs, producing alike painful menstruation and sterility as well. It must be remembered that where this condition occurs, there is a great tendency to increased congestion of the organ, and consequently to an unhealthy state of the lining membrane. There are some who assert that by far the most common conditions associated with sterility are congenital narrowing of the os externum and retroflexion of the uterus; and that in any given case of a woman who remains sterile five years after marriage and suffers from dysmenorrhœa, it may be predicated with almost certainty that one or other or both of these conditions exist.

Cases of this nature require careful treatment. If we attempt to put in a stem so as to keep the uterus straightened out, before relieving the congestion that so often exists, we shall probably set up a considerable amount of mischief, and do much harm.

Anteversion of the uterus cannot be regarded as a very frequent cause of sterility, for however much the uterus may be tilted forwards during the erect position of the patient, the tendency is for the fundus uteri to fall back again when the patient assumes the recumbent position.

If the uterus be considerably anteverted in a patient where sterility occurs, it will generally be found that some abnormal condition of the uterus, as endometritis, fibroid tumor, congestion, or other primary producing cause is present, the utero-sacral as also the round ligaments becoming shortened in consequence, and thus tending to perpetuate the misplacement.

It is by pressure of the os uteri against the posterior vaginal wall, the cervix being forced against the rectum and the fundus against the neck of the bladder, that irritation of this viscus, in some cases almost amounting to cystitis, occurs, and dysmenorrhœa and sterility not infrequently result.

Anteflexion of the uterus, being probably one of the most frequent forms of uterine displacement, is very often associated with dysmenorrhœa and sterility.

The body of the uterus, in place of being continuous with that of the cervix, is bent at a more or less acute angle, so that the fundus can be felt in front of the cervix, often so low as to be on a level with the os uteri. A moderate degree of flexion may exist without any very manifest symptoms, but if the flexion be at all acute, we shall generally have more or less irritability of the

bladder, pain at the periods, pain on sexual intercourse, and even in walking or standing, together with dragging sensations in the lower abdomen, and other nervous and distressing feelings. In cases like these sterility almost invariably results, the canal of the uterus being bent at such an angle as to effectually close it at the point of flexion, and thus prevent the entrance of the spermatozoa.

The treatment will be found fully discussed under the section on Ante flexion of the Uterus.

Ovarian.—There are several conditions of the ovary that may account for sterility. Absence of the ovaries is generally associated with imperfect development of the uterus, and as a consequence, amenorrhœa. The ovaries may be present, but so imperfectly nourished from the general health being debilitated, that the maturation of ova is arrested for the time being, and only when the general health improves will perfect ovulation take place. This condition is by no means infrequent.

The ovum itself may degenerate in the Graafian sac and never be expelled, or its extrusion may be so interfered with by the presence of adhesions or thickening of the serous coat or fibrous investment of the ovary, that it never reaches the Fallopian tubes at all.

Cystic disease of the ovary may prevent the healthy development of ovules, so also chronic ovaritis. That sterility is not more frequent from this cause may probably be explained by the fact of there being two ovaries, and both of these are not necessarily the subject of inflammatory or other diseased action at the same time. They are only simultaneously affected and structurally destroyed in very severe and general diseases.

The ovary again may be bound down by adhesion, or so covered with false membrane that the ovum cannot penetrate the capsule and find its way into the tube.

Fallopian Tubes.—Absence of the fimbriæ, or of the tubes themselves; twisting, occlusion by means of stricture or false membrane, or from the pressure of some fibroid tumor of the uterus just at the junction of the tubes with this organ; adhesions, from pelvi-peritonitis, of the tubes to neighboring organs preventing the ovary being grasped by the fimbriated extremities, may interfere with the passage of the ovule into the uterine cavity, and thus produce sterility.

Salpingitis, or inflammation of the tubes, may lead to their obliteration by adhesion, or to their becoming obstructed by thick mucus or a collection of pus.

These causes of sterility, even if diagnosed, are mostly irremediable. Suggestions as to catheterizing the Fallopian tubes were made some years since, but no practical end has been attained.

Although temporary sterility may result, it does not necessarily follow that it will be permanent. Adhesions may break down or become absorbed; deposit, as in pelvic cellulitis, may clear off, or such modifications in the relation of the parts ensue as no longer to offer a bar to fertility.

Syphilis, although it may not prevent impregnation taking place, yet unquestionably must be regarded as a not infrequent cause of sterility, in that patients suffering from this disease seldom produce a living full-time foetus until means have been adopted to cure the constitutional disorder by anti-syphilitic remedies. The normal development of the decidua is interfered with. It is liable to undergo fatty degeneration and to break down, the ovum being expelled at such an early date that the fact even of pregnancy having commenced is unrecognized, and the expulsion of the ovum is merely regarded as profuse menstruation.

In other cases the development of the ovum goes on for the first few months, depending upon the intensity of the poison with which the system is infected, and then becomes blighted, and ultimately expelled. Frequent abortions are generally dependent upon some syphilitic taint. Where this is suspected or known to be the case, it may be requisite to submit both husband and wife to a course of constitutional treatment, precautions being taken to prevent impregnation until such time as the system is no longer saturated with the disease.

Gonorrhœa in the female is a far more frequent cause of sterility than generally believed. It is not always that we shall be able to trace the history of an acute attack, nor is it even necessary that the husband should contract the disease during married life. It has been clearly proved by Dr. Noggerath that when once the disorder has been contracted by the male, even though all marked symptoms may have completely disappeared, with the exception of a slight gleet, it is still possible for him to communicate many years after a form of so-called latent gonorrhœa to the female. Increased vaginal discharge with menorrhagia are usually the earliest symptoms, followed by cervical endometritis, salpingitis, ovaritis, pelvi-peritonitis, often apparently suddenly developed without any well-ascertained assignable cause, or as a result of some trivial operation that does not generally cause the least anxiety.

When once the sexual apparatus has become infected, there is a great tendency to relapses, often sudden and inexplicable. Whether from adhesive changes taking place around the ovaries and tubes from these recurrent attacks of perimetritis interfering with ovulation, whether from some chronic ovaritis or from the secretions formed in the genital passages interfering with the vitality of the ovum and preventing its proper development, the fact remains that a large number of these cases prove sterile or only have one child.

The treatment needs to be conducted with great care, the mere introduction of the sound, or of a laminaria or sponge-tent to dilate the cervix, the insertion of a stem, the application of a few leeches, or of some caustic, or the most trivial operation, may suffice to bring on an acute attack of perimetritis.

With the exception of sterility produced by congenital malformations, that arising from this condition resists treatment most obstinately.

Vitality of the Semen may be interfered with or destroyed by un-

due acidity of the vaginal mucus, excessive alkalinity, or unusual viscosity of the cervical mucus, such as is so frequently found in cases of cervical endometritis. Where the patient is subject to menorrhagia or profuse leucorrhœa, this may interfere with impregnation. Epithelioma uteri, even in an advanced stage, where the discharge is profuse and acrid, does not necessarily prevent impregnation taking place. Numerous instances have occurred where utero-gestation was present, the cervix uteri being in an advanced state of disintegration from malignant disease.

Prevention of fixation of the ovum may result from an unhealthy condition of the lining mucous membrane of the uterus, the requisite changes for the formation of the decidua not taking place, or from some strumous or syphilitic cachexia being present, fatty degeneration of the decidua occurs at an early stage and the ovum becomes blighted.

Menorrhagia from ovarian irritation may also keep up such a condition of the mucous membrane of the uterus as unfits it to form healthy decidua, or, as Dr. Barnes remarks, "if impregnation have occurred, the ensuing menstrual nixus, too powerful to be controlled by the pregnancy, may be attended by a profuse hæmorrhage, which brings about extravasation into the decidua, or such other disturbances in the uterus as are incompatible with the maintenance of the ovum."

The ovum itself, either as the result of constitutional syphilis or other morbid taint, may have so little inherent vitality as to become blighted at an early stage.

Treatment.—As the removal of the cause is the only means of overcoming the difficulty, our first effort must be to ascertain what cause or combination of causes in any given case seems to account for the fact of sterility, and to remove these if possible. Any mechanical impediment that may be discovered must be dealt with surgically, as indicated when enumerating the various causes.

Where displacements of the uterus occur these must be rectified by suitable means, pessaries in cases of ante- or retro-version, and intra-uterine stems where flexion occurs. Instruction for inserting these will be found under the heads of Ante- and Retro-flexion of the Uterus. If it be considered undesirable to insert a stem, the cervix may be divided anteriorly or posteriorly, so as to straighten as far as practicable the uterine canal.

In cases where any inflammatory condition of the uterus is found or believed to exist, such as is likely to interfere with the healthy development of an impregnated ovum, efforts must be made to overcome this. The application of a few leeches to the uterus; scarification or puncture of the cervix; the application of nitric or carbolic acid or nitrate of silver to the cervical canal just after the menstrual period; the administration internally of the biniodide of mercury with nux vomica and tincture of cinchona, or, where ovarian irritation is present, a mixture of bromide of potassium and ergot, will often succeed in relieving the condition of the uterus, and thus enable us to overcome the difficulty.

Whatever condition be detected at all likely to prevent conception, it will be well to obviate or remove this at once, and not to assume that it is inadequate to account for the infertility.

A large number of cases of sterility are curable, if only we give sufficient time and attention to the individual cases, firstly in endeavoring to ascertain the cause, and then in persevering with the plan of treatment deemed requisite. Failure often results from a too hurried or not sufficiently careful exploration of all the various circumstances that throw light upon the subject. We remove some manifest cause of obstruction to impregnation, and because conception does not speedily occur, we consider the case is hopeless or beyond the aid of treatment. It may be that there are a series of causes in any one case, all of which must be removed before success attends our efforts. Having overcome one difficulty and given the patient a fair and reasonable opportunity of profiting by the advantage thus gained, should pregnancy not ensue we must then seek to find out and remove if possible any other condition likely to cause an impediment to conception.

In some instances it may be necessary to change the whole mode of life, or to insist upon a regular course of treatment extending over many months. If the patient be anæmic or in feeble health, a course of ferruginous tonics, with cod-liver oil, out-door exercise systematically persevered with, a residence at the seaside during the summer months, and other expedients, must be resorted to, with a view to improving the general health and thus indirectly favoring healthy ovulation.

Should the womb be infantile or undersized, in a case like this we may in addition try the effect of dilating the cervix by means of a laminaria tent, or of the insertion of a galvanic stem into the uterine canal, watching carefully lest any ill effects result; or electricity applied to the ovarian regions or to the uterus itself. Warm water injected *per vaginam*, or even an enema, warm hip-baths, pediluvia, and other remedies of this kind should not be forgotten.

Should the patient be plethoric, unnaturally stout for her years, we must endeavor to diminish her bulk. For this purpose it may be necessary to put her into training. We must diminish her diet, more especially as regards sugar, milk, butter, bread, potatoes, and beer. She must take steady, regular exercise, the action of the skin being assisted, if requisite, by the aid of Turkish baths, and that of the bowels by means of saline aperients.

The waters of Ems, Kissingen, and Marienbad have the credit of reducing obesity, but only when taken so as to purge.

In addition to this, any local congestion or other disorder of the uterine or ovaries must be attended to.

In some patients the mere fact of leaving off stimulants, more especially if spirits have been indulged in, will relieve any local congestion and enable the ovum to become fixed and the requisite changes in the mucous membrane to take place.

The most favorable time for fruitful congress seems to be immediately before and just after the menstrual period. During men-

struation, and for a few days before and after, the sexual apparatus is in a state of active congestion, and it is at these times that impregnation is most likely to occur. Ovulation and menstruation are so intimately associated the one with the other, even if the one be not dependent upon the other, that we can readily understand why impregnation should be more apt to take place at these times, though instances are not unknown where conception has occurred from a single coitus at the mid-period, a clear fortnight from either menstrual epoch.

A visit to some of the mineral water spas, either in this country, as at Woodhall Spas, Bath, Buxton, and Tunbridge Wells, or on the Continent, as at Ems, Aix-les-Bains, Schwalbach, Kreuznach, and numerous others, is by some regarded as very advantageous in chronic uterine disorders leading to sterility.

Change of air and scene, the mere fact of leading a healthier life, rising early and taking exercise, regular bathing, the advantage of daily medical supervision, are alone calculated to prove serviceable to those whose frames are weakened by long-standing uterine mischief and their will enfeebled by deteriorated health. Beyond this it is difficult to imagine that, except in a very small percentage of cases, mineral waters are sufficient to break down the barrier to maternity.

The ascending douche, the alternate hot and cold douches, the wet packing, the prolonged soaking, and various other ingenious hydropathic devices, doubtless prove of service in cases of leucorrhœa and other simple disorders of the female organs; but that hydropathy can obviate the defects produced by a conical cervix, uterine displacements, and all the other numerous causes of sterility that have been mentioned, is not only unlikely but unreasonable. Before, therefore, suggesting a visit to any of these mineral spas, the practitioner should endeavor to remove any and every condition that is likely to interfere with fertility, and not trust too implicitly to what, after all, can but be regarded as a means of improving the general health.

CHAPTER XXXIV.

CLIMACTERIC DISORDERS, INCLUDING PSEUDO-CYESIS.

Climacteric Disorders.—After some five and thirty years of functional activity, the pelvic organs, which had been the subject of periodical congestions and determinations of nerve-force, being no longer stimulated, the process of ovulation is arrested, and we have coincidently a cessation of menstruation, the so-called menopause or change of life, which is properly regarded as a critical event. A complete revolution or re-arrangement of vascular and nervous supply is necessitated, and frequently, before the new *régime* is established, an interregnum occurs in which the patient suffers from well-marked constitutional disturbance, the transition stage often proving most trying to the digestive, circulatory, and nervous systems.

Climacteric disturbances often extend over two or three years. There is no fixed uniform period for the catamenia to cease, the age varying from forty to fifty, or even later. The necessity for modifying habits that may be prejudicial to the well-being of the patient must be explained to her. She will need to be encouraged to persevere with treatment, to abstain from alcohol, to restrict her diet, and attend to the general health. It is generally a trying time, but after it is over, patients seem to take a new lease of life, and regain their former health and spirits.

Although, as a rule, the majority of functional and organic diseases of the female generative organs decrease in intensity after the menopause, yet there is a considerable proportion of cases in which the reverse happens, even to the extent of the disease becoming malignant. A local investigation should therefore always be made in all cases where the hæmorrhage is unusual in quantity or duration, lest malignant degeneration be overlooked.

The nervous phenomena are often most prominent, and may tax all the resources of the practitioner to deal with them. Irregular nerve-storms, evidencing instability and disturbance of the nervous system, are evidenced by severe headaches, vertigo, hysterical attacks, epileptoid seizures, cerebral congestions, and even apoplecticiform attacks. In some instances there is much irritability of temper, nervous depression, or even mental despondency verging upon hypochondriasis, or even developing into insanity where any hereditary predisposition exists. The patient becomes fretful, impatient, forgetful, cannot sustain her attention for long at a time, is subject to the most painful indecision, often becomes suspicious or morose, secluding herself from even her dearest friends, and not infrequently resorting to secret drinking or open acts of intemperance.

The headache is chiefly occipital, the pain often extending down

the back of the neck, as if some heavy weight was pressing upon the part. Convulsions followed by coma or delirium not infrequently occur, the cerebral functions remaining impaired for some time afterwards. Aphasia is often present, or a wrong word is substituted for the proper one, the patient herself being perfectly conscious of the mistake and yet unable to rectify the error. In some cases the attacks are epileptoid, in others more resembling prolonged syncope, there being an almost complete loss of consciousness, the patient not remembering anything which occurred during the attack. These may be partly due to the weakened condition of the heart, either from its being loaded with fat deposit, degenerated in fibre, or so dilated as to prevent its acting efficiently under the call of sudden excitement or exertion.

The heats and chills and flushings of the face on the slightest emotion or fatigue, with feeling of giddiness or vertigo, are chiefly due to the irregular nervous supply, the sympathetic and vaso-motor systems being mainly in fault.

Disorders of the digestive system are generally a marked feature at the climacteric epoch. The extinction of the ovarian function is generally associated with a tendency to corpulence, fat is deposited about the internal organs, interfering with their functional activity. The suspension of the menstrual flow, which may be regarded in the light of a cleansing or depurative excretion, throws extra work upon the skin, liver, and kidneys. The former condition often leads to neglect of exercise, and consequently defective secretion from these organs. Constipation, inactivity of the liver, and flatulent distention of the intestines ensue. Irritation, from the accumulation of fæcal matters, with frequent spasmodic or irregular painful contractions of the intestines, often occasions much distress, and not infrequently leads to the supposition of the existence of pregnancy—the so-called false or spurious pregnancy. This distention of the abdomen, as Dr. Barnes points out, is due in some cases to loss of tension of the abdominal walls, the result of pregnancy; to loss of tonicity from defective nutrition attendant upon invalidism and want of exercise; to obstruction to the action of the bowels from pressure on the rectum, as from retroversion or prolapsus of the uterus. Lithiasis is very apt to occur, the passage of gravel or red sand often causing excruciating agony.

Vascular disturbances are noticed in the form of vicarious hæmorrhages from the rectum and nose, and there is also an increased liability to cerebral hæmorrhage. The menstrual flow may diminish gradually in frequency, duration, and quantity, may stop suddenly, or become irregular both as to periodicity and quantity, constituting what is popularly described as “dodging.” There may be a terminal flooding or a succession of floodings, often sufficiently profuse to induce a marked degree of anæmia. In some instances the floodings alternate with serous offensive discharge, leading to the supposition of cancer.

The disposition to metrorrhagia is no doubt aggravated by the sluggish action of the liver, skin, and kidneys.

Treatment.—Much may be done to lessen the inconvenience experienced by patients at the climacteric epoch by careful attention to the regulation of the other functions. The skin may be encouraged to act by the judicious employment of the Turkish bath, the warm bath, friction with rough towels or flesh-brush, regular daily exercise, the wearing of flannel, and, if necessary, by the administration of diaphoretics, of which the liquor ammon. acet. is one of the best.

Where dyspeptic troubles occur, apart from regulating the diet, much good may be obtained by prescribing a mixture like the following:

R. Spir. amm. arom. ℥ss, sodæ bicarb. ℥ss, tinct. nucis vom. ℥ij, tinct. gent. co. ℥iss, syr. zingib. ℥j, aq. menth. pip. ad ℥vj.—M. One tablespoonful in a wineglassful of water half an hour before meals.

This may be varied by the addition of rhubarb in place of gentian, if not objected to, or by omitting the syr. zingib., and giving the mixture in combination with gr. xv of acid. citric., allowing the effervescence nearly to pass off before drinking it.

In some cases, where the appetite is very deficient and the digestive powers feeble, it may be better to order

R. Acid. nitric. hydrochl. dil. ℥ij, tinct. nucis vom. ℥ij, tinct. cinch. co. ℥iv, tinct. chlor. co. ℥ij, syr. aurantii ℥j, aquam ad ℥vj. One tablespoonful in a wineglass of water twice or thrice daily after meals, or a mixture of quinine and strychnia, or other appropriate tonic, may be given.

The action of the liver must be stimulated, if requisite, by small doses of calomel (gr. j-ij), or blue pill (gr. ij-ijj), combined with aloes, colocynth and hyosevamus, or pil. rhei co., podophyllin, etc.

A very useful form of pill is R. Quiniæ sulph. gr. xii, pil. hydrarg. gr. xx, ext. bellad. gr. iij, pil. colocynth. co. gr. xij.—M., et div. in pil. xij. One at bedtime, alternate nights.

A pill at bedtime should be supplemented the following morning by some saline aperient, such as the Hunyadi Janos, Friedrichshall, or Pullna waters, or the Carlsbad salts, Seidlitz powder, or other similar agent.

Where the nervous symptoms predominate, bromide of potassium proves of great value in allaying nervous irritability. If sleeplessness be present, chloral combined with the bromide at bedtime, xv-grain doses of each, often secures refreshing sleep. In some cases it may be requisite to give opium in some form, such as the liquor. opii sed. ℥ xv-xx; nepenthe ℥ xx-xxv; pulv. ipecac. co. gr. x; liq. morph. acet. ℥ xv-xxv.

If occipital headache persist, the application of some evaporating lotion, containing liq. atropiæ or tinct. bellad., may first be tried; should this fail, cupping, to eight or ten ounces, from the nucha or between the shoulders, will often exert a most beneficial influence.

Where the patient is very plethoric, and there is evidence of cerebral congestion, or convulsions, epileptiform or apoplectiform attacks occur, the abstraction of eight or ten ounces of blood from

the arm is not only perfectly justifiable, but will prove of much service. If the practitioner hesitates to perform this, the application of half a dozen leeches to the temples or behind the ears may be resorted to instead.

The abstraction of a small quantity of blood, whether by leeches, cupping, or venesection, acts beneficially in relieving vascular tension, equalizing the circulation, and in proving a direct and effective substitute for the menstrual flow.

Salines may be employed with advantage, their good effect being often enhanced by the addition of digitalis or aconite.

The establishment of an issue in the back of the neck or on the arm, operates as a valuable derivative.

Diet will need to be strictly enforced. Meat must be taken sparingly, and not more than once daily. All rich made-dishes should be avoided; fish, game, or poultry being taken in preference to soups, joints, and entrées. Alcoholic stimulants, whether in the form of beer, wine, or spirits, should, as a rule, be completely given up. They do far more harm than good, and if patients can only be induced to abstain for the space of one week, they will themselves find the advantage. The heats and chills, flushes and sinkings, headache and fidgettiness, materially diminish; the patient sleeps and eats better, feels freer and lighter, better able to get about, and altogether improved.

In some few instances alcohol may be necessitated. Beer is unsuitable; all heavy wines, such as port and sherry, should be avoided. Some light sparkling wine or claret, mixed with one of the effervescing table waters, may be tried; only at meal-times, however, never to counteract the sinking feeling so often experienced between meals. For this, the best plan is to crumble a biscuit and sip a little cold water, or at most take a little sal-volatile in cold water.

Tea and coffee must be taken in strict moderation, the less the better, especially tea, which interferes with digestion, and encourages flatulent distention of the intestines.

Pseudo-cyesis.¹—False, or spurious, or imaginary pregnancy, may be observed almost at any time, not only during the active functional life of women, but even long after the menstrual function has ceased. It is, however, more frequently observed about the menopause from the flatulent distention of the abdomen, accumulation of fat, and cessation of the catamenia. The breasts also, being involved in the tendency to adiposity, become larger, and thus apparently corroborate the supposition of pregnancy. The movement of air in the intestines, and the spasmodic contractions of the abdominal walls, often closely simulate the foetal movements, and tend to mislead, not only patients who have previously borne children, but even the practitioner who imprudently relies more upon the subjective statements than upon the objective signs.

The patient having once conceived the idea of the existence of pregnancy, her memory, if she has already been a mother, readily

¹ From *ψεῦδος*, a lie, and *κύησις*, pregnancy.

supplies her with any missing symptoms; or she draws upon her imagination for her facts if she has not previously borne children, "conjuring up into seeming existence the signs which are suggested to her eager mind by hearsay or reading," until, the wish being father to the thought, she deludes herself into the belief that she is actually pregnant. This belief varies in different patients, from that of a not unnatural mistake, which, after a careful examination, the practitioner can rectify by a simple explanation of the facts, to that of a persistent conviction, a veritable delusion, which no amount of reasoning or explaining will dispel, but which becomes strengthened by opposition and persists often for long beyond the time of normal pregnancy.

Spurious pregnancy has been observed in single women who have indulged in clandestine intercourse. Mental anxiety and fear of consequences have first led to suppression of the catamenia, the general health becomes disordered, indigestion, nausea, constipation, with flatulent distention of the intestines follow, and the dread of exposure and sense of shame so preys upon the mind as to overthrow the faculty of judgment, and render the patient the most miserable of mortals.

In the newly-married, more especially when sterile, even when the catamenia are only irregular or scanty, patients not infrequently are subject to imaginary pregnancy. They would fain console themselves with the hope so natural to their sex, and readily believe what they hope to be true.

Hysterical females are often found presenting symptoms of phantom tumor of the abdomen, which may readily be mistaken for pregnancy unless the practitioner be on his guard. Pelvic projection, or arching of the back, with rigidity of the abdominal muscles, often increase the apparent enlargement of the abdomen, and may easily deceive the unwary.

In patients at the climacteric period, the abdomen generally feels doughy, the walls are very fat, and on pressing the hands on either side of the abdomen there is an absence of any sense of resistance such as would be encountered if any firm globular tumor existed. On auscultation, borborygmi, or movement of air in the intestines, may generally be heard, and no placental murmur or foetal heart-sounds can be detected. If any doubt still exist, the administration of chloroform will soon clear up the diagnosis. The back, which was arched forwards, becomes straightened, the abdominal walls relaxed, so that the hand can sink down almost to the spine.

On examination *per vaginam*, the finger detects the cervix, normal in size, consistence, and position; not enlarged, softened, and directed backwards, as in pregnancy. On conjoined manipulation, the uterus can be made out of natural size and mobile.

Diagnosis.—Objective signs, and not subjective symptoms, must alone be relied upon in forming an opinion. The patient being placed in the dorsal position, the several steps mentioned when speaking of physical diagnosis must be resorted to. On inspection, the abdomen may be symmetrically enlarged, on palpation it is

found to be tense and resistant, on percussion it is more or less resonant, depending upon the thickness of the abdominal walls from fat, care being taken to get the deep, and not merely the superficial, note. If the patient's attention be distracted, we may often succeed in pressing the fingers almost down to the promontory of the sacrum. It is well not to rely upon the patient having recently passed water, but to employ the catheter at the time of the examination, so that no error may arise from a distended bladder.

Where the breasts are enlarged, it will generally be found that it is due to fat, and there are seldom the characteristic changes of pregnancy. Besides, the tendency to obesity is uniform, the limbs and face participating in the general increase, whereas a pregnant woman usually becomes more or less pinched in the features.

The differentiation from ascites and ovarian tumors will be found fully considered under this latter heading.

Treatment.—The administration of an anæsthetic often serves a double purpose, in clearing up the diagnosis, and at the same time dispelling the patient's illusion. Although we may thus prove that the patient was in error as regards the existence of pregnancy, it may still be very necessary to attend to the condition of her general health, and improve the state of the nervous system. The indications already given when speaking of the treatment of climacteric disorders should be attended to, the bowels especially being carefully regulated. A pill of the following often prove very serviceable:

℞. Ext. bellad. gr. iij, quiniæ sulph. gr. xij, zinci valerianatis gr. xij, pil. aloes et assafœtidæ gr. xx.—℥., et div. in pil. xij. One to be taken twice daily. A chalybeate tonic may be given, such as ℞. Mag. sulph. ʒss, tinct. nucis vomicæ ʒij, tinct. ferri perchlor. ʒij, pot. acet. ʒij, syr. zingib. ʒj, aq. menth. pip. ad ʒvj.—℥. One tablespoonful thrice daily in a little water. Another useful formula is the following: ℞. Spir. amm. foetid. ʒiv, tinct. valerian. amm. ʒvj, tinct. lavand. co. ʒss, tinct. nucis vom. ʒij; syr. zingib. ʒj, aquæ camph. ad ʒvj.—℥. One tablespoonful in a wineglassful of water occasionally.

A well-fitting abdominal belt, by giving support to the weakened abdominal wall, and taking off the downward pressure of the intestines loaded with fat, generally gives great relief. Galvanism in some cases seems to be useful. Gentle friction to the abdomen, alone or with some stimulating liniment, such as the lin. chlorof. et bellad., or the lin. camph. co., may also be tried.

Change of air, especially to the seaside, regular exercise, moderation in diet, abstinence or strict moderation as regards alcohol and tea, and other similar indications, should not be forgotten.

CHAPTER XXXV.

HYSTERIA—VAGINISMUS—DYSPAREUNIA.

Hysteria.—A manual of diseases of women would not be complete without some mention of a disorder difficult to define, to which the female sex, although not exclusively, are more particularly liable. Dr. Reynolds, in an article upon hysteria in his "System of Medicine," to which I am largely indebted for the following remarks, regards it as a perturbed condition of the nervous system. The essential character of this morbid state is an exaggeration of involuntary motility and a diminution of the power of the will; the emotional, sensational, and reflex movements are in excess, while the voluntary are defective.

Dr. Barnes insists strongly upon the ovarian theory, proposing, indeed, to alter the term hysteria to that of "oöphoria." He says it is not organic disease of the ovary that causes hysteria, but that disorder, that difficulty in the performance of its function, which is so common in young persons. Charcot has demonstrated that the convulsions of hysteria can be controlled, resolved by firm pressure upon the ovary. At the same time the pressure causes a characteristic pain, inducing painful radiations towards the epigastrium, complicated sometimes with nausea and vomiting; next, if pressure be continued, palpitation, with extreme frequency of pulse, soon follows; and lastly the sensation of globus hystericus is developed in the neck.

Pathology.—Anatomical investigation has failed to show the presence of any organic lesion which is either so constant or so prevalent in hysteria that it may justly be regarded as its cause. It is common to find some derangement of the digestive, the assimilative, or of the reproductive systems, but these may exist without hysteria; and *vice versâ*, that disease may be present when those bodily functions are healthily performed. Flatulent distention of the abdomen, eructation, nausea, and vomiting, frequently result from ovarian irritation. This is explained on anatomical grounds by the connection of the sympathetic nerve-supply of the ovarian plexus with the upper aortic and renal, and so with the solar plexus. There is, however, one thing common to all cases of hysteria, and that is a perturbed condition of the nervous system, and this is brought into existence (if not inherited) by those conditions which are the most active in producing disorder of the mind; in the female sex, by vexatious emotions, want of sympathy or success, disappointed and concealed affection, want of occupation, fear, and morbid conditions, or supposed morbid conditions, of the reproductive system. The primary fact in that condition which we term hysteria would seem to lie behind all that is re-

ferred to in the considerations upon the inter-relations of physical, mental, and moral life, and to consist in that special morbid change of the nervous centres which either gives to emotion an undue influence or removes the limitations of its actions. The earliest departure from health is often to be found in the disturbed balance of mental and emotional operations.

Causation.—The most frequent predisposing cause is that condition of the nervous system which is more or less characteristic of the female sex—an habitual constitutional or induced relation between the several elements of mental, moral, and physical life.

Hysteria usually commences at or about the time of puberty, between twelve and eighteen years of age; but when once developed, the symptoms may remain throughout life. It is more common in the single than in the married. It is said that the wives of incompetent husbands, and barren women, as well as widows and old maids, are frequent victims of the hysteric malady. Still, it is not limited to the single, and it may exist to its highest degree in the married. It is more often witnessed among the upper classes of the civilized races, in whom emotionalism is intensified at the expense of reason and self-control by injudicious training in childhood, and the subsequent pampering that ill fits them for the trials of life.

Dr. Reynolds maintains that it has not yet been shown that hysteria has any definite relation to the varying conditions of menstruation. Menorrhagia, by reducing the vital power through loss of blood; dysmenorrhœa, by effecting the same result through nervous exhaustion; or amenorrhœa, by its physically direct, and mental and morally indirect influence, may, either of them, conduce to the increase, or even development, of the hysteric state; but it has yet to be shown that either one of these is of itself sufficient to produce the disease. Hereditary taint has not been shown to exert any marked influence in the development of hysteria, though the influence of an hysterical mother is very prejudicial.

The most frequent determining cause of an outbreak of hysteric symptoms is some mental or moral disturbance, either a violent and unexpected commotion, or more commonly the occurrence of a trivial circumstance which takes the individual by surprise, overcomes the power of restraint, and gives evidence of what is often an ill-understood but long-concealed annoyance or distress. Anything that intensifies any pre-existing nervous affections; debilitating influences like great loss of blood; diseases; physical, mental, and emotional shocks, prolonged worry and want of sleep, may all be mentioned. Dr. Graily Hewitt contends that when there is an organic cause for hysteria, that cause will be found to be a chronic flexion of the uterus.

SYMPTOMS.—*The inter-paroxysmal symptoms* are numerous. As to the mental and emotional state, “the will is perverted and defective, while ideas and emotions exhibit excessive activity. The patient asserts that she cannot control her thoughts, emotions, expressions, or general movements; that she cannot move this or

the other limb; cannot open the eyes; cannot stand or walk; cannot relax the rigid spasm of the hand or of the leg; and what she says is true under the existing conditions. But often, under the influence of some unexpected idea, or emotion, or sensation, she does the very things that were said to be impossible. Ideation is often excessively active in regard to certain classes of thought; emotion is commonly excessive in itself, and also in its expression. Laughter and sobbing not only alternate, but co-exist.

Sensibility may be altered in several distinct directions; there may be increased, painful, perverted, or diminished sensation, or there may be absolute though partial anæsthesia. Pain is generally complained of. The favorite haunts of hysteric pain are the top of the head, the left mammary region, the hypogastric, and the sacral. Dr. Barnes asserts that iliac pain is the most constant, and the primary feature in hysterical attacks. Pain in the coccyx or one of the joints of the limbs is also frequent. Other sensations are felt, such as want of breath, the action of the heart, the intestinal movements, the processes of micturition and defæcation, and even those of sexual intercourse, to an exaggerated degree and in a distressing manner. "Globus hystericus," or feeling of a ball or lump in the throat, as if it would choke her, is almost typical of hysteria.

In health there are different kinds of movements which the muscular system exhibits; some are voluntary, others depend upon idea, a third group upon emotion, a fourth upon sensation, and a fifth upon impressions which are not felt. In hysteria the normal relation is perverted, and there is an excess of the involuntary motility and a diminution of the volitional.

Paroxysmal Symptoms.—Owing frequently to some real or imaginary grievance, or to some unexpected or unexplained occurrence, an hysterical patient suddenly gives a scream or makes a spluttering noise, appears to lose voluntary power and self-control; she falls down, with snorting breathing and a quasi-tonic contraction of the muscles of the extremities and trunk. She makes hideous grimaces and outrageous noises, throws her limbs about in a disorderly manner; utters incoherent sentences, adopts histrionic attitudes; complains of her throat and stomach and breathing; appears exhausted or faint, and sometimes stupefied; occasionally she seems to lose her consciousness, and then after a fit of crying to be herself again, the attack frequently terminating in a copious involuntary discharge of limpid urine.

Negrier has directed attention to "pelvic projection," or throwing forward of the pelvis as often as the hand is applied to the hypogastrium, as being a frequent and remarkable symptom of oöphoria or hysteria.

Differentiation.—From epilepsy it may be separated by negative characters. There is rarely absolute or sudden loss of consciousness; the patient does not fall in such a manner as to hurt herself or tear her clothes; there is somebody near who shall see the phenomenon; hysteric paroxysms do not occur during sleep, or when

the patient is alone; there is something artistic in the mode of their approach—the hysteric patient gathers her robe around her and falls gracefully; she appears to the casual observer to be unconscious, but there is not real or absolute loss of sense or of perception; there is not the hideous distortion of features observed in epilepsy, nor is there the dilatation of the pupil; the eyelids may quiver, and the eyeballs may be turned up, but there is no divergent strabismus, nor is there the wide-open eye. There is no bitten tongue, nor the reckless injury of either the person or the clothes. The breathing is tumultuous and noisy, but there is no such absolute arrest of respiration as to cause asphyxia. The patient looks about, the attack lasts longer, there is much sobbing and crying, much apparent exhaustion, but no real stupor.

Hysterical mania sometimes appears after an attack. The patient is unmanageable, sometimes mischievous, and very often highly abusive; but generally is merely loquacious, unreasonable, and demonstrative in regard of emotion, and the attack speedily subsides under judicious treatment, though it exhibits a great tendency to recur. Organic diseases of the nervous centres, which are sometimes simulated by hysterical paralysis and anæsthesia, may be excluded by a proper attention to details. Usually the phenomena presented are inconsistent with the idea of any definite disease of either the cerebrum or the spine; the paralyses are imperfect in development, vague in their distribution, and changing in their locality; they are not accompanied by the alterations of nutrition, or of electric contractility or sensibility, which are proper to other affections; and the history of the case will usually reveal their true nature. An hysteric patient does not look at her feet, as those who are ataxic do, but looks round about her to observe the effect of her performance. The ataxic or paraplegic patient tries to walk; the hysteric girl tries to show that she cannot use her limbs.

The distribution of pain described by hysteric patients supposed to be suffering from neuralgia is, moreover, often so wide of all relation to anatomy and physiology, that its true nature may be recognized.

From various inflammatory affections, such as peritonitis, laryngitis, and arthritis, hysterical symptoms may be distinguished by a careful use of the thermometer, which fails to show any rise of temperature. Phantom tumors may be removed by the inhalation of chloroform, while palpation and percussion usually reveal the nature of their constituents.

Prognosis.—When once established, hysteria is very difficult to cure, and this is true under all the conditions of causation. The most difficult cases are those in which it is but an exaggeration of a constitutional defect, inasmuch as it is impossible to cure the malady without changing the individual, and this is by no means an easy task. When hysteria is a disease, and the physician has given to him a *carte blanche* to treat it as he deems best, the patient may be cured; but when it is a constitutional peculiarity, and the

physician is checked at every turn by anxious friends, limited in this direction and in that by frightened, too sympathetic, or unwise relatives, the prognosis is unfavorable, the case is hopeless, and might as well be left alone.

Treatment.—Bearing in mind the pathology of the disease, it is highly important that its earliest indications should be recognized and combated. Prevention is better than cure.

The tendency of the patient's education should be to develop the faculty of self-control, and to take her out of herself. She should feel that she is understood and cared for, and yet kindness must be blended with firmness, and all exhibitions of a want of self-control should be checked. The bodily health should be looked to without any admission or appearance of anxiety on the part of others; the diet simple, and the intervals between meals not too prolonged; plenty of sleep, but not too much lying about on sofas; exercise short of fatigue; recreation, but not any precocious or preternatural excitements; the hours of study not too prolonged, and strictly within reasonable limits.

If the patient be anæmic, iron in the form of Easton's syrup, the citrate of quinine and iron, or other appropriate form, must be prescribed. Quinine, strychnia, and vegetable bitters, mineral acids and other suitable tonics, or bismuth and alkalies with nuxvomica if indigestion with flatulence be troublesome. The bowels must be regulated with aloes and belladonna pills, or other suitable aperients.

The usual anti-hysterical remedies, such as musk, castor, valerian, assafœtida, and the like, are of little real service, and large doses of bromides do more harm than good. It is not a question of medicine, but of mental and moral management.

If any uterine disorder be detected it must be remedied if possible, a stem being inserted, or appropriate pessary adjusted, if any flexion exist. Any menstrual irregularity should be attended to; any ovarian irritation treated as elsewhere indicated.

Treatment of an hysterical paroxysm.—An attack of hysterical convulsions will often test the practitioner's powers even more than other more serious emergencies. The solicitude of over-anxious, unwise, too sympathetic, or frightened relatives or friends, is calculated to do far more harm than good to the patient, and often interferes materially with the practitioner's efforts. The first thing, therefore, will be to exclude from the room every one except some judicious female friend or relative, who must be enjoined to refrain from talking to the patient, whether to express sympathy or to attempt scolding, allowing the patient to recline at full length on the floor, or on a bed or couch, as may be most convenient. Everything tight round the waist or throat should be at once loosened; the patient, being perfectly conscious of all that is taking place around her, care should be exercised not to make any remarks betraying alarm or anxiety. A calm, quiet manner, a combination of kindness and firmness, is best fitted to impress the patient. A towel dipped in cold water may be flapped upon the cheeks or

upper part of the chest, but it is cruel to drench a patient with water, spoiling her clothes and saturating the bed or carpet. A smelling-bottle applied to the nostrils, and a firm injunction to take a long, deep breath, will often cut short or materially weaken the force of the paroxysm. It is unwise to attempt to control every movement of the patient, or even to urge her to lie quiet, and not toss her arms about.

The mere physical exertion serves to expend a portion of the superfluous nervous energy, and to shorten the attack. Care should be taken that the patient does not injure herself unnecessarily, though it will generally be found this precaution is not needed, the patient herself instinctively avoiding doing so. If there be much tossing of the head, it is well to place a soft cushion or pillow under it. As soon as the patient can swallow, a little cold water, or a teaspoonful of sal-volatile, properly diluted, may be given. In some instances, where flatulent distention of the intestines is a marked feature in the case, a threatened attack may often be averted, or when present shortened, by inserting a rectal tube so as to allow a free escape of flatus. The same object is often sought to be attained by administering an enema of rue or assafoetida, plenty of warm water being employed, so that the flatus may be all absorbed by the water, or passed off when the bowels respond. Charcot has demonstrated the fact that pressure upon the ovary, by the hand externally, in the iliac or inguinal region, will often serve to control convulsions or arrest the paroxysm of hysteria. Récamier has suddenly extinguished hysterical convulsions by causing a lady's maid to sit on her mistress's belly. Dr. Hare suggested forcibly preventing the patient from breathing for a certain time by holding the nose and mouth. The effect of such constraint is to make the patient, when allowed to do so, draw a long breath, this vigorous inspiration being usually followed by a relaxation of all spasm and a disappearance of the fit.

Although Dr. Reynolds and others speak favorably of this method, Dr. Barnes "cannot look upon this revolting practice without shame and humiliation that such ignorance and brutality should be so far recognized as to be discussed."

If, in place of attempting to reason with, scold, or entreat an hysterical patient, the practitioner remains silent, and shows no unusual symptoms of alarm or anxiety, the patient, as a rule, will soon look about her, and, failing to detect a sympathetic and excited audience, will bring her efforts to a close, and cry herself to sleep after her fatiguing exertions.

Where the paroxysm is very severe or very prolonged it may be necessary to give a few whiffs of chloroform, or try the effect of the inhalation of three drops of the nitrate of amyl. The application of galvanism is successful in some cases, and may be tried when an apparatus is at hand.

The injection of iced water into the rectum has been recommended.

Aphonia may often be cured by electricity, the most useful mode

being that of giving sparks to, or taking them from, the larynx. The voice is sometimes instantaneously restored.

Paralyses are treated very successfully by faradisation, and by passive movements and frictions, employed by a well-instructed nurse. Dr. Reynolds says, "I have, however, found no mode of treating hysterical paralyses comparable in efficiency with that of placing narrow strips of blister completely round the affected limbs. This method of treatment has succeeded perfectly and rapidly, after all other plans have failed."

Rigid contractions may be relieved by the continuous galvanic current, but much more successfully by the inhalation of chloroform, and the adaptation of some apparatus to maintain extension when the effect of chloroform has subsided.

Dr. Playfair has lately directed attention¹ to the systematic treatment of nerve-prostration and hysteria connected with uterine disease, as advocated by Dr. Weir Mitchell, of Philadelphia.² Goodell, in his "Lessons on Gynecology," devotes a chapter to the same subject under the head of "Nerve-tire, or the Relation of Neurasthenia to Diseases of the Womb." Dr. Playfair thus describes these cases: "The protean symptoms we have to deal with are such as gradually develop themselves in those confirmed invalids who are so widely scattered over the country, who have been from one doctor to another, subjected to all sorts of uterine medication, mechanical and other, with no lasting improvement, until eventually they become bedridden, or nearly so, sleepless, victims to chloral and morphia, worn and wasted, and burdens to themselves and their families.

"Many of these cases have drifted far beyond the point at which local treatment, however judicious, is capable of effecting a cure. The pain, the backache, the leucorrhœa, the difficulty in progression, the disordered menstruation, which are attendants on the local troubles have ended in producing a state of general disturbance in which all the bodily functions become implicated. The nervous system is profoundly affected, the blood impoverished, and the general nutrition at the lowest ebb.

"Such cases have two or three prominent symptoms in common, among the most marked of which are wasting of the fatty tissues, combined with anæmia, the patient having gradually lost all appetite, professing a total inability to take a healthy amount of food, and often consuming barely enough to support vitality. Associated with this are very marked dyspeptic symptoms, too often aggravated by the pernicious habit of deadening pain by chloral, morphia, or stimulants. As a necessary consequence of such a state, and partly no doubt from local pain, all exercise is abandoned, and the patient becomes entirely confined to the house, or even to bed. Another group of symptoms which soon show themselves under such conditions are those of a moral character, the patient becoming emotional and hysterical, constantly craving for sympathy,

¹ The Lancet, May 28, 1881.

² Fat and Blood; and How to Make Them.

which she often obtains to a degree most prejudicial to her welfare, until at last the whole household becomes victimized by the morbid selfishness thus developed. Every practitioner must know of cases of this kind, and must be familiar with the useless endeavors at cure which have been made by tonics, the water-cure, and a hundred other plans, each of which has proved equally unsuccessful.

"It is in such cases that Dr. Mitchell's method is applicable, and it is based on the principle, which must be admitted to be perfectly physiological and reasonable, of removing the patient from the unwholesome moral atmosphere in which she has been living, combined with the renewal of her vitality by excessive feeding, which, under ordinary circumstances, could not be assimilated, but which is rendered possible by passive muscular exercise obtained through the systematic use of shampooing and electricity. At first sight this sounds, perhaps, chimerical; and, had I not myself witnessed the astonishing success which followed its use, I should doubtless be as sceptical as others may be as to its value. The plan involves four principal heads, each of which I shall refer to separately.

"1. *Seclusion and Rest*.—An important element in the treatment, and one which, from what I have seen of these cases, I believe to be absolutely indispensable, is the entire seclusion of the patient under a competent nurse, and her removal from the morbid atmosphere of invalid habits which has gradually grown up around her. Unless the patient is entirely removed from the injudicious sympathy and constant tending of her friends, it would be next to impossible to gain that moral influence over her which is really essential to success. This is a point which involves so severe a strain that it may be found very difficult to obtain the consent of the patient and her friends to a measure which will seem to them so harsh and strange. I do not think, however, that any compromise on this point should be admitted, and if it be found impossible, from domestic reasons, to secure the removal of the patient from her house, it should, at least, be made an absolute *sine quâ non* that she should be placed in a separate room with her nurse, and that she should not be visited by any one except her medical attendant. On this point Dr. Mitchell's experience is worthy of note. 'I have often,' he says, 'made the effort to treat these cases in their own homes, and to isolate them there, but I have rarely done so without promising that I would not again complicate my treatment by such embarrassments. Once separate the patient from the moral and physical surroundings which have become part of her life of sickness, and you will have made a change which will be, of itself, beneficial, and will enormously aid in the treatment which is to follow.' The first step, on commencing, is to place the patient at rest in bed. It will readily be understood that this absolute repose is only intended as a temporary resource, until, by the means presently to be described, the nutrition is improved, and new tissues are built up. Independently of the physical benefit in patients apt to suffer from exhaustion on the slightest fatigue, there is a distinct moral gain. From a life of irregular hours, and probably endless drug-

ging, from hurtful sympathy and over-zealous care, the patient passes to an atmosphere of quiet, to order and control, to the system and care of a thorough nurse, to an absence of drugs, and to simple diet. As a rule, in bad cases this repose in bed is continued during the greater part of the treatment, averaging from six to eight weeks; and at first the rest is made absolute, the patient being only allowed to rise for the purpose of passing her evacuations, and is neither allowed to read, to sew, nor to feed herself. Practically there is so much to do with feeding, massage, and electricity that this is not found so wearisome as might be supposed; but, no doubt, the monotony of the life and the growing strength, which accompanies a satisfactory progress towards cure, tend to make the patient the more willing to throw off her old habits of invalidism when the proper time arrives to make the effort. By degrees the period of repose is lessened, and the patient is gradually made to sit up for several hours, until towards the end of the cure she only rests on the bed for three or four hours daily.

“2. *Massage*.—This, combined with ‘faradisation,’ is a very important part of the treatment, and it consists in systematic shampooing and exercise of all the muscles, both of the extremities and trunk, first for half an hour or so twice daily, but very soon for not less than an hour and a half night and morning. By this means the cutaneous circulation is improved, and the muscles are brought into active exercise without the expenditure of nerve-force. To do this effectually considerable experience is required, and although in one or two cases I have had it done successfully by the nurse, it requires so much intelligence on her part, and she is besides otherwise so fully occupied by the rest of her work, that I think it preferable to employ a regular rubber. Full details of the method to be adopted, and the best way of exercising the various groups of muscles and the joints, will be found in Dr. Mitchell’s book. It is surprising how soon the patient comes positively to enjoy a manipulation that for the first few days is very trying. Soon all local tenderness disappears, and a pleasant sense of exhaustion, followed by refreshing sleep, is alone experienced. In two of my cases the abdomen, especially in the ovarian regions, was so tender that the patient at first shrank from the slightest touch, but in a very short time she could be freely handled and kneaded in every part.

“3. *Electricity*.—This forms a valuable subsidiary means of exercising the muscles. The interrupted current is employed twice daily, from half to three-quarters of an hour. Here, again, some practical skill is necessary, but with a little careful teaching on the part of the practitioner, the use of the battery can be safely and efficiently entrusted to the nurse. The poles, armed with wetted sponges, are placed on the muscles to be operated on in turn, about four inches apart, and slowly moved until the muscle is fully and freely contracted. Commencing with the feet, the whole body, except the head, is thus systematically gone over. There is no doubt that this is painful and disagreeable, but it is of unquestion-

able utility, especially in cases such as the one presently to be narrated, in which there was long-standing hysterical paralysis, and consequent atrophy from disuse of extensive groups of muscles.

"4. *Diet and Regimen.*—These form the most important and most characteristic part of the cure. It is perfectly astonishing how, under the conditions above described, a pale, anæmic, and wasted invalid, able to eat next to no food, can be brought to consume, and not only to consume but perfectly to assimilate, an amount of nourishment that would appear to be incredible had experience not amply proved the fact, so that she shall gain flesh, weight, and strength so rapidly that the change is almost apparent to the eye from day to day. The first step, after secluding the patient with the nurse, and before the massage is commenced, is to place her on a diet of milk alone, given at intervals of three hours. At first three to four ounces are given at each feeding, but in a couple of days or so the amount is increased to eight or ten ounces, so that within three or four days she is consuming two to three quarts of milk within the twenty-four hours. No difficulty is experienced in getting the patient to take this quantity, and if she suffers, as so many of these cases do, from dyspeptic symptoms, they rapidly disappear. After the first two days, when the stomach is settled, the massage is commenced, and along with it an increased amount of food is administered, commencing with bread and butter, an egg, or the like, for breakfast; then, in a day or two, a chop finely cut up, with some vegetables, is given at mid-day, and so on progressively, until in from ten days to a fortnight three full meals daily are given, besides from a quart to two quarts of milk in divided quantities, and a considerable amount of soup made from raw beef, after a receipt given in Dr. Mitchell's book. It seems impossible, but it is nevertheless a fact, that under the use of massage and electricity these large amounts of food are taken readily without the slightest feeling of dyspepsia or discomfort."

Dr. Mitchell finds the simple milk diet a great aid towards getting rid of chloral, bromides, and morphia, all of which he is usually able to lay aside during the first weeks of treatment, as also alcoholic stimulants. He gives two ounces of fluid malt-extract before each meal, and half an ounce of cod-liver oil half an hour after each meal, as soon as the patient can digest it, generally at the third week of treatment.

So soon as the patient begins to take other food than milk he gives iron in large doses, two scruples of the subcarbonate in half a tumbler of aerated water; or where this is not well borne, he gives five grains of the pyrophosphate, or six to nine grains of the dialyzed iron.

Unless some special need arises, iron, in some form, is the only drug he uses until the patient begins to sit up, when he gives nearly always $\frac{1}{30}$ of a grain of strychnia thrice daily.

The method is well worthy of attention, and if only properly carried out proves most successful.

Vaginismus.

Sims defines this as excessive hyperæsthesia of the hymen and vulvar outlet, associated with such involuntary spasmodic contraction of the sphincter vaginae as to prevent coition.

It is by no means infrequent, though, from false delicacy on the part of the patient or practitioner, its presence is not always revealed. It may be idiopathic, due to excessive nervous irritability affecting the whole system, as witnessed in hysterical patients, or it may be symptomatic of some apparently insignificant local disorder. Under the head of Dyspareunia will be considered numerous conditions producing spasm of the vagina or pain on coition. We shall here only enter upon the subject of vaginismus proper.

Symptoms.—Exquisite sensitiveness of the vulval outlet, so marked as to throw the patient into a state of extreme nervous trepidation and apprehension on the least attempt at digital examination or sexual intercourse. If either of these be persevered in, violent spasm and contraction of the sphincter vaginae muscles ensues, attended by agonizing pain. In well-marked cases, the slightest touch, such as occurs from friction in walking, or on washing the parts, is sufficient to cause painful spasm. Barnes remarks that in some cases the irritability of the nervous centres becomes so great, the sensitiveness of the peripheral nerves at the vulva so acute, and reflex action thereby so intensified, that the attempt at intercourse will induce convulsion, or be followed by syncope. Exaggerated emotions, the conflict between affection and the dread of pain, may induce similar results.

Prognosis.—Dr. Sims tells us, “from personal experience I can confidently assert that I know of no disease capable of producing so much unhappiness to both parties to the marriage contract, and I am happy to state that I know of no serious trouble that can be so easily, so safely, and so certainly cured.” Dr. Thomas also states that he has met with no case in which he has not been able to give relief.

Course and Duration.—The affection, when severe and of long standing, unless relieved, may remain indefinitely, becoming a permanent source of discomfort and misery. The milder forms, such as not infrequently witnessed in the newly married, may disappear in a short time, either naturally or by the aid of simple treatment. Still, as Barnes so graphically describes it, “the distress, so long as the patient continues exposed to attempts at intercourse, is generally aggravated by time; health breaks down under the nervous exhaustion produced by repeated suffering, and what may be called the disappointment of nature under an unfulfilled function. In some cases the irritability of the nervous centres becomes so great, the sensitiveness of the peripheral nerves at the vulva so acute, and reflex action thereby so intensified, that the attempt at intercourse will induce convulsion, or be followed by syncope. Exaggerated emotions, the conflict between affection and the dread of pain, may induce similar results.”

Treatment.—Physiological rest for a time, until the nervous system has regained its power, and the irritation of the parts has been relieved, is absolutely essential. Repeated or awkward attempts at coitus keep up such a state of nervous distress, and produce so much local suffering, that unless strict abstinence is enjoined, treatment is of no avail. The affection as met with in the newly married is often very difficult to deal with for this reason. Rest for a time, a warm hip-bath at bedtime, bathing the parts with a lotion of borax, or using vaginal injections, regulation of the bowels by saline aperients, and the administration of nervine tonics, iron, quinine, strychnia, etc., will generally succeed in relieving cases of minor severity of recent occurrence.

A careful examination should always be made, so that any fissures, abrasions, or ulcerations may be detected and properly treated. The application of the nitrate of silver or of strong carbolic acid will occasionally be found requisite. Before any renewed attempts at intercourse are submitted to, the precaution of anointing the vulval aperture with cold cream or olive oil will serve to lubricate the parts, prevent unnecessary irritation, and facilitate intromission. After the latter has taken place, the irritation produced by disappointment of an unfulfilled function is removed, and the difficulty, once so distressing, soon disappears.

In the severe forms of the affection, where local irritation has been subdued, any fissures or excoriations removed, but still the spasmodic contraction on any attempt at sexual intercourse continues, it will be necessary to resort to other expedients.

Dilatation of the vagina may first be tried. Anæsthesia having been produced, forcible distention is effected by means of a trivalve speculum (Fig. 146), gradually expanded, or of tubular specula, gradually increasing the size, or by introducing the two index-fingers of either hand, or the thumbs, if preferred, back to back, and then pulling them in opposite directions until the ostium vaginae has been thoroughly distended.

FIG. 146.



Lane's Three-bladed Rectum Speculum.

Sims's vaginal dilator (Fig. 147), Barnes's vaginal rest, or an elastic dilator (Fig. 148), will have to be worn for a few hours at a time, daily or alternate days, depending upon how it is tolerated. Its presence will tend to numb the nervous sensibility, and so overcome or wear out any tendency to spasm, to keep the sphincter vaginae on the stretch and distend the vagina, and produce a tolerance of foreign bodies.

Others recommend enlarging the vulval outlet by making two or three incisions through the skin on either side of the fourchette. Subcutaneous division of some of the fibres of the sphincter vaginae is another method, with a similar object. A tenotomy knife is passed under the mucous membrane at the posterior edge of the vulva,

near the perineum. When it has penetrated flatwise about an inch, the edge is turned outwards, and the tissues cut towards, but not through the skin.

If the hymen be found to be very dense, and the fourchette thick and unyielding, the aperture may be enlarged by slight incisions on either side of the mesial line, or by incising the perineal body exactly as it is torn in parturition. The vaginal rest must then be inserted, and kept in for as long at a time as the patient can tolerate it.

It may be kept securely in place by adjusting a T bandage.

In addition to these operative measures, vaginal injections, morning and evening, of warm water, with the addition of some soothing

FIG. 147.

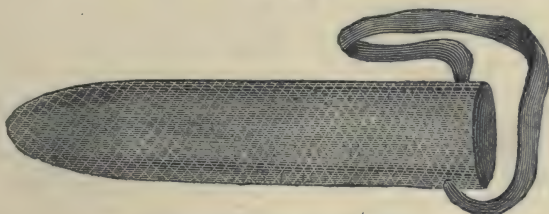


Sims's Glass Vaginal Dilator.

lotion, such as plumbi acetatis (ʒj) and tincturæ opii (ʒss), ad aquam Oj; glycerate of borax (ʒij ad Oj aquam); glycerate of carbolic acid (ʒss ad Oj aquam), or other similar agents, may be employed.

Pessaries of morphia, morphia and atropine, conium, and other

FIG. 148.



Elastic Gum Vaginal Dilator.

alkaloids, passed into the rectum or vagina at bedtime, are also of service.

Ointments of atropine (gr. ij-vj); morphia (gr. ij-iv); hydrocyanic acid (ʒj-ʒij), and vaseline or lard (ʒj), may prove useful.

Should these means fail, or an over-sensitive condition of the carunculæ myrtiformes be detected, the pain even on the slightest touch being so exquisite that the patient shrieks out, it will be necessary to excise by means of curved scissors the hypersensitive portions. Anæsthesia should first be produced, the patient being placed in the ordinary lithotomy position, and the parts held separate by an assistant. By the aid of vulsellum forceps or a tenaculum, one of the projecting nodules is seized and removed with curved scissors, a complete ring being excised, including all the tender points. Pressure and cold are generally sufficient to re-

strain the hæmorrhage; but if this be severe, the cut surface may be lightly touched with the actual cautery or the liquor ferri perchlor. Strips of lint soaked in carbolized oil are then inserted in the vagina, and a pad of cotton-wool applied, a T bandage being adjusted to obviate any further risk of hæmorrhage. Sims's glass vaginal dilator, or Barnes's vaginal rest, may be worn for a few hours each day during the process of healing, absolute rest being enjoined until the surface is thoroughly healed, which generally takes three or four weeks. Section of the pudic nerve, as originally recommended by Burns, is both a difficult and dangerous operation, and should not, as a rule, be attempted.

Sterility is an almost invariable result of vaginismus. Should pregnancy, however, fortunately occur, the act of parturition would probably produce a radical cure. Sims proposed inducing anæsthesia, in the hope that complete connection, accomplished under these circumstances, might prove successful in causing impregnation.

Dyspareunia.

The term dyspareunia, from *δυσπαρευνος*, signifying difficult or painful performance of the sexual function, was originally employed by Sophocles, and has been lately revived by Dr. Barnes.

This symptom, depending as it does upon many and various conditions of the genito-urinary organs, is of far more frequent occurrence than is generally imagined. Owing to the mutual diffidence of the practitioner as well as the patient in entering upon such a delicate subject, it is too often passed over without comment, and yet, if the truth were known, there are numbers of cases where this condition is the cause of much physical suffering, mental distress, and conjugal infelicity. In many instances it is a mere temporary condition, and may disappear without treatment or by the employment of very simple remedies.

In other cases it will continue as long as the condition producing it remains unaltered, even to twenty-five or thirty years, in fact, becoming permanent.

Causes.—These, as will be seen, are very numerous.

Atresia of the vulva or vagina. Imperforate hymen.

Hyperæsthesia of the vulva or carunculæ myrtiformes, producing vaginismus.

Excoriations and fissures of the vulva.

Unusual depth of the pubic arch.

Vascular growth of the meatus urinarius.

Follicular inflammation of the vulva.

Vaginitis, whether simple or specific, or from injuries during labor.

Inflammation of Bartholini's glands.

Too short a vagina.

Elongation of the cervix; endometritis.

Congestion and inflammation of the uterus.

Prolapse of the ovary, with neuralgic or inflammatory complication.

Neuromata.

Diseases of the rectum, such as fissure at the anus.

Abnormally rigid perineum.

Fistula, ulcer, inflamed piles, impacted feces, and coccygodynia.

Imperfect, violent, unskilful, or too frequent attempts at intercourse.

Imperfect or disproportionate development in the male and the female organs.

Tumors or growths from the vulva.

Displacements of the uterus, more especially retro-version and -flexion.

Pelvic cellulitis and peritonitis, both in the acute and chronic stage, fixity of the uterus being the chief cause in the latter.

Cancer and fibroid tumors of the uterus.

Contraction or atresia of the vulva and vagina, the result of disease, injury, or cicatricial processes.

In many instances proceedings have been instituted to establish a nullity of marriage on the plea that completion of the marriage contract could not be effected owing to some congenital malformation. There may be an absence of the vagina, or imperfect development of it, in the form of unusual narrowness or shortness of the canal, either from the uterus being set too low in the pelvis, so that the os uteri is within an inch or so of the vulva, or from undue length of the vaginal portion of the cervix, which projects as a conical mass into the vagina. The hymen may be dense and unyielding, or there may be unusual depth of the pubic arch.

Consequences.—Dyspareunia commonly entails sterility, but not always, for though intercourse may be difficult and painful, still it may be accomplished; and again, complete intercourse is not necessary for impregnation. The causes which induce dyspareunia are also often of themselves obstacles to impregnation. The nervous irritation produced is often extreme, the health breaks down from the exhaustion produced by repeated suffering, and so much misery is caused in some cases that the mind gives way.

Symptoms.—These will naturally vary with the cause producing this condition. Painful or difficult coitus may be regarded as the generic symptom, but the kind and degree of this will depend upon circumstances.

In one case the mere contact of the finger or male organ will serve to produce the most violent spasm, in another little or no inconvenience is experienced at the orifice, but severe aching, or dragging, or sickening pain is complained of when pressure is made further in. If any condition of the pelvic organs be detected in married women likely to produce inconvenience in sexual relations, although no complaint may have been made by the patient beforehand, the practitioner will do well to inquire more carefully into the matter.

Treatment.—Remembering that dyspareunia is seldom an idiopathic but generally a symptomatic disorder, our first effort should be directed to ascertaining the causal condition. This may need

much care and consideration on the part of the practitioner, but it will well repay him, for unless he succeed, treatment can but be empirical, and will probably be of little avail. Should any imperforate condition or unusual thickening of the hymen be detected, the propriety of an operation for its relief will at once occur.

In the case of a newly-married patient it will generally be advisable to administer some anæsthetic, not so much with a view to rendering her unconscious of pain, as to relieve the natural distress incidental to the exposure and requisite manipulation. Should the hymen be found to be intact, a crucial incision may be made and the opportunity taken of passing a speculum to dilate the vaginal orifice, a little lint soaked in carbolized oil being then inserted to prevent adhesion between the divided edges.

Occasionally it happens that some small vessel is divided, and the hæmorrhage is somewhat free. Cold, torsion, ligature, the application of nitric acid or caustic to the bleeding point, or failing these a touch with a red-hot knitting-needle, will generally succeed in arresting the hæmorrhage.

Should atresia of the vulva or vagina be detected, an operation must be resorted to.

This will be fully described in speaking of Atresia.

Where hyperæsthesia or undue sensitiveness of the vulval orifice is present, physiological rest for a time, hip-baths, tonics, local sedatives in the form of pessaries, ointments, or lotions will be advisable.—(See Formulas.)

Change of air, sea-bathing, bodily exercise, and strict attention to the laws of health, will also assist materially in improving the tone of the nervous system and contributing towards recovery.

Where excoriations or fissures of the vulva exist, the application of the argenti nitratis, either in form of solid stick or a strong solution (℞ ad ʒj aquam) is generally advisable. This condition is by no means infrequent during the first week of married life, and is mainly due to imperfect, awkward, or frequent attempts at coitus. Abstinence for a few days must be enjoined, hip-baths, lead lotion, or borax or zinc will generally succeed in affording speedy relief. The employment of cold cream or olive oil subsequently will obviate further difficulty.

Occasionally a form of obstinate and recurrent superficial excoriation, analogous to lupus, associated with small tubercles, exists. The application of the actual cautery, or strong caustics, such as nitric acid, will here be indicated.

The careful application of very strong carbolic acid to an excoriated surface has the effect of producing a healthier condition of the part, and also of deadening the excessive sensibility.

Where dyspareunia arises from vascular growths from the meatus urinarius, the application of the galvanic cautery, chromic acid, pernitrate of mercury, or removal, as indicated under vascular growths, will generally be required.

Follicular inflammation of the vulva occasionally occurs from neglect of cleanliness, the irritation caused by vaginal discharges

or the so-called leucorrhœa of pregnancy. This produces much burning and discomfort, and renders coitus painful and impracticable.

Bathing, sedative lotions, the application of a solution of argent. nitratis, together with vaginal injections, will soon relieve the symptoms.

Where unusual depth of the pubic arch exists, the vulval aperture is carried much further back than usual, the patient being as it is called "deep set." In such cases attempts at coitus are unsuccessful, and much mental anxiety and local distress are occasioned. The patient is possibly told that she is not rightly formed, which adds considerably to the irritation already produced by unfulfilled desires. Surgical interference is here uncalled for; a change from the supine to the lateral position only, "*more ferarum*," will overcome the difficulty and obviate an otherwise frequent and fruitful source of conjugal infelicity.

Where disproportionate development in the male and female organs exists, or where the vaginal orifice seems to be very small, it may be advisable to enlarge it by a few incisions through the skin, a speculum being passed alternate days, gradually increasing the size for a short time, or the patient herself directed to insert Sims's vaginal dilator or Barnes's vaginal rest, and wear it for a few hours each day.

Physiological rest should be enjoined absolutely until the incisions have healed, and the parts should be well lubricated before any further attempts are made.

It will be unnecessary to enter seriatim into the treatment of all the various causes producing dyspareunia, the mere enumeration of the causes themselves will be sufficient to guide the practitioner. The surgical treatment of vaginismus will be found fully discussed under this latter heading (p. 535).

CHAPTER XXXVI.

FUNCTIONAL DISORDERS OF THE BLADDER.

Irritability of the bladder, with frequent micturition, is often noticed quite independently of cystitis or disease of the bladder itself. It occurs in hysterical and very nervous patients.

In ante-version and -flexion of the uterus, frequent micturition is often a prominent symptom. I have seen instances where micturition was performed as many as forty times within the twenty-four hours for a period extending over many consecutive months, the condition being at once relieved by the insertion of an intra-uterine stem.

Frequent micturition is often an early sign of pregnancy, especially when the uterus is anteverted, and also occurs in the latter part of pregnancy. Granular cervicitis, when present, aggravates considerably the irritability of the bladder.

Dysmenorrhœa is often associated with vesical tenesmus. Any inflammatory condition of the uterus is also more likely to produce irritability of the bladder at the menstrual periods.

The presence of small ovarian tumors in the pelvis, of fibroid tumors or enlargement of the uterus from any cause; cancer of the neck of the uterus; abscess in the cellular tissue between the urethra and vagina; peri-uterine hæmatocele, and other similar conditions, may also cause irritability of the bladder with frequent micturition.

There are certain conditions of the bladder itself which may give rise to frequent micturition, such as calculus, cystitis, cancer, ulceration. Vascular excrescence of the urethra, urethritis, inflammation of hæmorrhoids, fissure, ulcer, or other affections of the rectum may also give rise to frequent micturition.

Abnormal conditions of the urine, from excess of uric acid, the presence of pus, blood, etc., may in some instances prove to be the exciting cause of irritability of the bladder. In cases of gout and oxaluria this symptom is often very marked.

Renal calculus may give rise to all the symptoms of stone in the bladder.

Dysuria.—Painful Micturition.—This may be due to some functional derangement of the digestive organs, or to some errors in diet producing undue acidity of the urine, or too concentrated a condition of it, or from the presence of uric acid crystals, of gravel, or even excess of lithates, as met with in gouty and rheumatic subjects. When the skin acts very freely, and sufficient fluid be not taken to compensate for the extra secretion, the urine often produces a feeling of burning or scalding on passing, or causes a frequent desire to micturate.

In other instances we shall find it is not so much really pain in the act of micturition as uneasiness afterwards, as if the bladder had not been properly emptied. This may arise from the falling forward on the neck of the bladder of the anteflexed fundus uteri. The presence of a calculus in the bladder should not, of course, be overlooked. Foreign bodies, such as hair-pins, pieces of slate-pencil, and other similar substances, have before now been found in the bladder, and have given rise to much local inconvenience.

Dysuria, or difficult micturition, may be due to the bladder being incapable of expelling its contents, or to some abnormal condition of the urethra preventing the urine passing.

Paralysis of the walls of the bladder may be produced by over-distention, as seen in cases of prolonged retention of urine; or by exhaustion of nerve-power, as in the latter stage of puerperal fever, etc., and also in paraplegia.

Organic disease of the bladder may give rise to difficult as well as to frequent and painful micturition.

Stricture of the female urethra is rarely met with.

Enlargement of the uterus, fibroid tumors, displacements, especially retroversion of the gravid uterus before impaction has occurred, may give rise to difficulty in micturition.

Ovarian tumors, pelvic cellulitis or hæmatocele, and other similar conditions, as mentioned in speaking of retention, may also occasion difficulty.

Partial retention, or difficulty in completely emptying the bladder, may be due to cystocele, the result of the prolapsed uterus dragging down a pouch of the bladder below the ordinary level of the meatus of the urethra. Urine accumulates in this pouch, and phosphatic and lithic concretions are apt to become deposited. The difficulty may be overcome by pushing up the pouch with the finger during micturition, or by passing water in the genu-pectoral position.

In cases of calculus there may be pain on walking or driving, but there is generally pain just at the end of micturition.

Cystitis, acute or chronic, often causes both frequency of and pain on micturition. The pain is present more or less constantly, as well as during micturition, when, as often happens, there is also a certain amount of urethritis.

Primary malignant disease of the bladder is very rare in women, but when it does occur there is marked pain in the region of the bladder, aggravated after micturition, which is also frequent. The urine is often turbid, occasionally mixed with blood. Free hæmorrhage may occur if the catheter be employed.

Urethritis, whether simple or specific, generally gives rise to intense scalding on micturition. In cases of gonorrhœa the pain seldom lasts more than a few days.

Vascular tumors of the urethra almost invariably occasion pain on micturition.

Excoriations of the vulva from acrid discharges, such as witnessed frequently in cases of uterine cancer, may become irritated

by the urine passing over the surface, and so causing scalding pain on micturition.

Retention of Urine.

Causation.—This condition may depend upon mere nervous influence, as witnessed occasionally in patients who are so extremely modest that they cannot pass water when another of their own sex is present in the room. Hysterical retention is another form of this. There may be even absolute suppression of urine for several days, or the amount secreted exceedingly scanty, constituting *hysterical ischuria*. Retention may be partly voluntary, owing to the patient dreading to incur pain on micturition, as witnessed in cases of vascular excrescences of the urethra and other painful affections of the neck of the bladder or other pelvic organs. The amount of reflex irritation produced by operations upon the rectum for fissures, hæmorrhoids, etc., or by operations upon the neck of the uterus, is often so great as to necessitate the employment of the catheter.

In cases of paraplegia, retention of urine is a marked symptom. Retention of urine may arise from undue distention of the bladder, as not infrequently occurs in young ladies out all day at a picnic, or patients on long railway journeys, or where opportunity is not taken to evacuate the urine when the desire to do so is experienced. The bladder refuses to act, the muscular coat of the bladder being temporarily paralyzed, and assistance has to be rendered.

It is a question whether in some of the cases of so-called hysterical retention, the inability is not partly due to this cause. Rapid secretion of limpid colorless urine in large quantities is often met with under these circumstances, and when an hysterical paroxysm occurs, if involuntary passage of the urine does not take place, the accumulation may become so great as to produce over-distention of the bladder and retention of urine as a natural consequence.

Retention may be due to irritation of the neck of the bladder producing spasmodic constriction, the result of cantharides, turpentine, and other similar agents.

In by far the larger majority of cases of retention of the urine in the female, it is due to pressure upon the neck of the bladder or the urethra by some pelvic complication. In certain comparatively rare instances the passage of the urine into the bladder is prevented by pressure upon the ureters, as in cases of very large ovarian cysts, or by occlusion of the ureters from impaction of renal calculi, or extension of malignant disease from the uterus.

The most frequent conditions liable to induce retention are *retroversion or flexion of the gravid uterus* about the third or fourth month; *fibroid or ovarian tumors* impacted in the pelvis; *retro-uterine hæmatocele*; *pelvic abscess*.

Less common obstructions may be *hæmatometra*, or retention of blood in the uterus, from atresia of the os uteri or vagina, or occlusion of the vulva; *extra-uterine gestation cysts*; *impaction of fæces in the rectum*; *tumors of the rectum*, or springing from the pelvic

valls; *abscess near the neck of the bladder; plugs* introduced into the vagina to arrest uterine hæmorrhage; *prolapse* of an enlarged uterus; *recent inversion*.

Tumors may be present in the pelvis, and yet cause only intermittent retention of urine. This may be explained by change in the position of the tumor, or by general increased tumescence of all the pelvic tissues, as happens at the menstrual periods.

Injury to the neck of the bladder during parturition, whether from prolonged pressure of the foetal head or from instrumental delivery; allowing the bladder to become over-distended by neglecting to pass the catheter when the patient is unable to relieve herself voluntarily; the mere fact of the patient lying on her back; the exhaustion of nerve-power from a tedious or difficult labor producing temporary paralysis of the bladder, may each of them prove to be the exciting cause of retention of urine.

Symptoms.—The history of the patient not having passed water for several hours, with urgent desire to do so; the sense of distention in the lower abdomen with more or less straining; pain of a forcing character; bearing-down sensation of an intermittent or recurrent nature, will generally be sufficient to direct our attention to the bladder. Where the retention has been allowed to go on for many hours unrelieved, a certain amount of dribbling of urine, or gushes of small quantities at a time, from the enormous hydrostatic and expulsive pressure, may lead to the supposition that some acute inflammatory mischief is present, and incontinence of urine exists.

Whenever stillicidium with bladder tenesmus or straining be marked symptoms, the catheter should always be employed. After the first twenty-four hours or so, if the bladder be not relieved, constitutional symptoms supervene. Febrile disturbance, rapid irritable pulse, nausea or vomiting, dry and furred tongue, parched lips, extreme restlessness, anorexia, sleeplessness, or in some instances somnolence, are well-marked.

Physical Signs.—The detection of a tense, painful swelling, more or less conical, in the hypogastrium, dull on percussion, occupying the centre of the abdomen, extending from the pubes towards the umbilicus, with the symptoms previously mentioned, will be sufficient to confirm our suspicions as to the nature of the tumor. Fluctuation, when the bladder is excessively distended, may be entirely wanting, the tension being too great.

Diagnosis.—That this is more difficult than would at first sight appear to be the case, is proved by the frequency of retention from over-distention being mistaken for suppression of urine. As a rule, in retention there is an urgent desire to empty the bladder, still the exceptions to this are numerous, as witnessed in cases of paraplegia, diseases producing great prostration, fevers, cancer extending to the bladder, implicating the ureters, and so inducing compression and atrophy of the glandular structure of the kidneys by the retrograde obstruction.

In every case where retention or dribbling of urine occurs, the

catheter should at once be employed. The bladder being emptied and the case proved to be one of retention, our next object is to ascertain the cause that has produced this. Supposing that no abdominal tumor be detected sufficient to explain the occurrence, we must then examine carefully for any pelvic complication.

Should the catheter pass readily without encountering any obstruction, and the finger inserted *per vaginam* fail to detect any abnormal relation of the uterus or other cause liable to produce pressure, we may infer that the retention is due to paralysis or other nervous disorder.

Should, however, some cause of obstruction be detected, we must endeavor to diagnose the nature of this with a view to treatment, so as to obviate the risk of retention again occurring.

Results.—Rupture of the bladder from over-distention is exceedingly rare. Before this accident would occur, overflow by dribbling or absorption of some of the watery portion of the urine would take place, and if the undue distention continued long the patient would probably die from exhaustion, owing to the prolonged agonizing pain, or by blood-poisoning.

Irritation of the coats of the bladder leads rapidly to congestion, and then to inflammation, exudation of blood taking place and producing the smoky tint of the urine so often noticed in these cases. Cystitis is thus set up which often proves very intractable. Where the diagnosis is not made sufficiently early, or appropriate treatment is not resorted to, the mucous membrane becomes exfoliated, either separating in shreds or coming away entire as a perfect cast of the bladder. This condition is more likely to occur in cases of protracted labor, where in addition to the over-distention there has been considerable contusion of the bladder, from pressure of the child's head, or from instrumental delivery, producing a slough which on separation constitutes a vesico-vaginal fistula.

Urinæmia may ensue from absorption of some of the urine. The ureters and pelves of the kidneys becoming involved in the retrograde distention, secretion is thus interfered with, and blood-poisoning, which terminates fatally, results from the combination of these two causes.

Peritonitis occasionally results from retention of urine. This may be due to slight oozing or permeation of the urine through the coats of the bladder, owing to the enormous pressure exerted by the distention of the bladder and the severe straining efforts to expel the contents.

Should the patient not succumb after prolonged retention, chronic cystitis and chronic nephritis are very liable to follow.

Treatment.—The passage of the catheter is at once the simplest, safest, and speediest method of relieving the patient, and should at once be resorted to.

Mode of introducing the female catheter.—The ordinary rigid female silver catheter should never be employed; it is objectionable in many ways. It is safer and better to employ a No. 8 or 10 gum-

elastic male catheter, and if it be necessary to pass it frequently, too great care cannot be taken in disinfecting it after being used and seeing that it is perfectly clean, lest septic matter or germs be introduced into the bladder, and cystitis be thereby set up. The patient, lying on her back near the right-hand side of the bed, with her knees drawn up, the practitioner, standing on the right side, having first withdrawn the stilette, oils the catheter and holds it ready in his left hand. Having lubricated the right index-finger with carbolized oil, and flexed it on to the palm, he then passes the right hand under the right thigh, extends the forefinger, and guiding it along the raphe of the perineum, introduces the tip of the finger just within the vaginal orifice. Keeping carefully to the median line, just under the apex of the pubic arch, the urethra can be felt as a cord. If the finger be now slightly withdrawn until the outer extremity of the cord be reached, a depression will be felt which is the urethral orifice.

The catheter, held in the left hand, is now passed over the pubes, and the point guided into the urethra by the right forefinger. A little gentle pressure in the proper direction guides the catheter into the bladder. The thumb meanwhile should be applied to the ivory end to prevent the urine passing until the vessel, which should previously have been placed handy, either in the bed or on the floor within reach, is brought sufficiently near for the urine to flow into it.

If thought desirable, a slender india-rubber tube, about four or five feet long, may be attached to the catheter before using it, so as to conduct the urine into the vessel placed on the floor, and thus obviate any risk of wetting the bed or soiling the linen.

In cases where retention is due to dragging upwards of the neck of the bladder by tumors, or from extreme distention of the bladder, care must be taken to press the catheter gently in the proper direction. If any pelvic tumor, retroverted gravid uterus, or impacted foetal head during labor, press upon the urethra, the passage of the catheter may be facilitated by the finger in the vagina guiding the instrument along the urethral wall, or by pressing back the tumor allowing the catheter to pass more readily.

If the operator prefer it, the left forefinger, properly oiled, may be passed over the pubes and drawn along the genital cleft until the tips of the finger detect the meatus urinarius immediately beneath the apex of the pubic arch. The gum-elastic catheter, held lightly in the right hand, is then passed beneath the right thigh and the point guided into the urethra.

Another method, far less distressing to the patient, is to place her in the left lateral or ordinary obstetric position, with her hips close to the side of the bed or couch. Having anointed the left index-finger, the back of it is then drawn along the raphe of the perineum, from before backwards, until the orifice of the vagina be gained. Turning now the palmar surface towards the arch of the pubes, the finger is withdrawn slightly, until the end is external to the hymen or carunculæ myrtiformes. The meatus urinarius can now be detected in the median line. The catheter is then

passed by the right hand along the palmar surface of the left forefinger, and guided into the urethra. If any unusual difficulty or delay be experienced, it is far better to elevate the right labium and see where the meatus is rather than distress the patient by prolonged manipulation. This can readily be done in the lateral position without anything like the exposure needed in the dorsal position. It is of great importance to the student to familiarize himself with this apparently simple operation, for at any time he may be called upon to perform it, and nothing distresses a patient more, who is suffering from prolonged retention of urine, than ineffectual attempts to relieve her, more especially if the parts are swollen and tender after a tedious labor.

Where the accumulation has been taking place for more than twenty-four hours, the urine will generally be found to be turbid, high-colored, or somewhat musty from sanguineous exudation, ammoniacal, and often extremely offensive.

Although the patient experiences marked relief, it is not always so complete as might be expected.

It will be necessary to pass the catheter every eight hours at least, until the bladder has had time to recover itself, the extreme distention having generally produced paralysis of the muscular coat, and not infrequently a low degree of cystitis. The treatment of any pelvic tumor, or other complication that has been the cause of the retention, will depend materially upon circumstances, and will be found mentioned under the appropriate headings.

If retroversion or flexion of the gravid uterus about the third or fourth month be detected, the patient should be placed in the genu-pectoral position. The catheter having been first passed, careful but persistent efforts must be made by the insertion of two fingers *per vaginam* to guide the fundus up to one side of the promontory of the sacrum, and so push it beyond the pelvic brim. If these measures fail, the right forefinger, passed high up behind the pubes, so as to pull down the cervix uteri, whilst the second finger of the left hand is passed *per rectum* to press up the fundus uteri, may possibly succeed. Should these attempts, however, fail, it will then be a question of inducing abortion, by passing a sound through the os uteri, and detaching, or if necessary rupturing, the membranes. If this again be impracticable, it may be necessary to puncture the fundus uteri by means of a small canula and trocar, and draw off the liquor amnii by means of an aspirator, thus diminishing materially the bulk of the uterus, and so allowing its replacement. Abortion may then be allowed to take place spontaneously, or expedited by dilatation of the os uteri, as necessity may suggest.

The introduction of an india-rubber ball, with a tube attached by which inflation may be accomplished, either *per vaginam* or *per rectum*, should never be omitted before resorting to more extreme measures. By this means continuous pressure may be secured, if the precaution be taken to adjust a T bandage, the patient retaining the genu-pectoral position as far as practicable.

Incontinence of Urine.—The involuntary discharge of urine,

whether during the daytime, or, as is far more frequently the case, during the night in children, and even in adults, is of far more frequent occurrence than many are aware of.

During early infancy the discharge of urine, as well as of the feces, occurs involuntarily; but as the infant grows older and becomes more intelligent, if only proper care be taken, it makes its little wants known, and except from the irritation of dentition or a temporary attack of diarrhœa, but little difficulty is experienced in educating it in habits of cleanliness and regularity. Still, in a certain number of cases, spite of all efforts to the contrary, the habit of wetting the bed at night continues, either habitually or on very slight provocation, and causes much distress alike to the nurse and the parents of the child.

We are not speaking here of those cases of irritability of the bladder where the incontinence occurs by day as well as by night, but of those instances where in young girls approaching the age of puberty, occasional or habitual incontinence of urine occurs during the night. Though a comparatively trifling affection in itself as regards the general health, it is by no means unimportant in its influence on the moral character when the patient has attained an age capable of feeling the shame so generally attached to this infirmity, and the scorn and ridicule heaped upon her for what she had as little agency in the production of as she has the power to prevent its continuance. A defaulter to the laws of cleanliness and health, she becomes taciturn, morose, and discontented. Although long habit gradually reconciles the mind to this, as it does to many other inconveniences, nevertheless she feels acutely the injustice of being blamed as guilty of idleness or carelessness, and possibly chastised for what is unquestionably a true infirmity, the supposed crime taking place when is she fast asleep, and unconscious of what is happening. It is the duty of every medical man to explain to the parents that the malady is a misfortune, and not, in a large majority of instances, a fault, and to point out how unjustifiable it is to correct by punishment a habit which is as loathsome to the patient as it is to her friends. There is a very general misconception upon this subject, and the sooner this is recognized the better for all concerned. In order to facilitate a systematic study of the subject, we shall at present limit our attention to the consideration of congenital incontinence of urine; and instances occurring in early childhood, up to puberty.

Causes.—Hereditary predisposition is by no means infrequent. The gouty or scrofulous diathesis, epilepsy, hysteria, spinal disease, dyspepsia, ascarides, prolapsus ani, and numerous other causes, have been credited with producing nocturnal incontinence of urine. Too free use of fluids, more especially of tea, coffee, and alcoholic drinks, particularly if taken late in the day, will certainly aggravate, if they do not cause, the tendency to this condition. In rare instances, imperfect formation of the urethral canal, associated with epispadias, may lead to congenital incontinence of urine, or this latter condition may be due to defective power over the sphincter.

Treatment.—There are few conditions the treatment of which is so unsatisfactory in its results, and which consequently bring so little credit to the medical man as this we are considering. More variety of remedies even than the suggested causes afford sure evidence that the various plans proposed have given little satisfaction. Still, if the case be thoroughly gone into, and persevering attempts made to overcome the difficulty, our efforts in time will generally be crowned with success.

We should, in the first instance, endeavor carefully to correct any error of diet or constitutional condition likely to keep up any derangement of the digestive and assimilative organs, and a consequent morbid change in the constitution of the urine. Where this is found to contain any excess of lithic acid, careful regulation of the diet, with a combination of alkaline carbonates and bitters, such as gentian, and soda or potash; occasional doses of citrate of magnesia; the daily use of the warm or tepid bath, with friction to the surface, warm clothing, daily exercise, and avoidance of cold and dampness, will generally prove of service.

Where the condition of the urine is pale and watery, of diminished specific gravity, and deficient in its usual saline ingredients, nitro-muriatic acid in some bitter infusion, with $\text{m} \vee$ -x of the tincture of nux vomica, will be likely to restore the healthy function of the digestive organs and improve the condition of the urine. Occasionally over-study, leading to excess of phosphates in the urine, may cause enuresis. Remedying this and improving the general health will here be indicated. In most instances tonics are indicated; of these, iron in the form of tinct. ferri perchlor., syrupus ferri iodidi, the ammonio-citrate or tartrate, with or without small doses of liquor strychniæ, are the most useful. Ol. morrhue with syr. ferri phosph. is often of service. It is well in any case to avoid partaking of much fluid during the after-part of the day, and to be careful to empty the bladder before retiring to rest.

Should ascarides in the rectum be suspected or ascertained, small doses of santonin, quassia and iron, bark and acid, together with injections of lime-water, a teaspoonful of common salt or a drachm of liq. ferri perchlor. to the pint of water, will generally prove successful.

The possibility of the urine being passed involuntarily during an epileptic seizure should not be overlooked. It is in these cases that large doses of the bromide of potassium and belladonna prove so efficacious. Hysteria, when occurring in paroxysms, generally terminates by an involuntary emission of urine; but as these attacks are more liable to occur during the day from some recognized exciting cause than during the night, it is probably not a very frequent cause of nocturnal incontinence of urine. Should this, however, be suspected, the treatment usually adopted in these cases should be resorted to.

Sea-bathing, cold sponging to the back and loins, galvanism over the back and lower abdomen, counter-irritation over the sacrum, should all be tried in intractable cases.

After having tried the various constitutional remedies suggested, and failed in our object, there still remains a class of so-called *specifics*, which will often enable us to attain our object after more general means have proved ineffectual.

Of these, belladonna deservedly holds the first place, and will be found to be more generally successful than any other remedy. It may be given even to very young children without any fear of evil effects resulting, though it is right to mention permanent loss of sight has before now been ascribed to the persistent use of this drug.

Dr. Burney Yeo, in the "Lancet" for October, 1870, states that the involuntary action of the sphincter can be supplemented and strengthened when necessary by voluntary efforts. Whilst awake, a very slight amount of voluntary effort is superadded to the involuntary contraction of the sphincter vesicæ, and the urine is thus prevented from escaping from the bladder. During sleep this voluntary effort is in abeyance, and so soon as the accumulation of urine becomes sufficient to stimulate the detrusor fibres to contraction, the weak sphincter gives way, and the bladder is evacuated in bed. Belladonna, acting through the sympathetic nerve-fibres, strengthens the involuntary efforts of the sphincter fibres at the neck of the bladder, and thus prevents the nocturnal incontinence. The efficacy of belladonna is not due to its allaying any irritability of the bladder, as none exists. During the daytime the bladder distends to quite as great an extent as is common. It cannot be due to its checking the secretion of urine, because the quantity continues the same as before. Neither to its altering the character of the secretion, which has never been other than natural.

"Belladonna acts by giving tone to the weakened sphincter vesicæ." It may be given in doses varying from 5 to 10 or 15 minims of the tincture thrice daily, the dose being gradually increased and steadily persevered with until improvement results, or the toxic effects of the drug are produced. If the extract be employed, it is well to begin with about one-twelfth of a grain, depending upon the age of the child, gradually increasing it to one-sixth and even to one grain.

In many instances there may be no appreciable effect for the first week or ten days, but a cure will result by continuing it perseveringly for several weeks. Trousseau found it inapplicable to cases in which the enuresis was present both during the day and at night. Bromide of potassium in 5 to 10 grain doses, either alone or in conjunction with belladonna or syrupus papaveris, often proves most serviceable.

The syrupus ferri iodidi in drachm doses thrice daily has in several instances succeeded in effecting a perfect cure, though, curiously enough, it occasionally causes incontinence in cases not previously subject to it.

Chloral hydrate has been recommended strongly by some, and successful cases have been recorded. It is difficult to explain its action, for it is generally supposed that the bladder is evacuated when the patient is in profound slumber. Still, the fact remains

that some cases have been materially relieved, if not permanently cured, by the administration of this drug.

In some instances, apparently, a too highly nitrogenized diet is the exciting cause. By resorting to milk diet exclusively the difficulty has been overcome, and this after various specifics had been tried in vain.

Tincture of cantharides has been extolled in those cases where there is congenital deficiency of control over the sphincter of the bladder, as occurs in very nervous children who wet themselves whenever sharply spoken to or frightened. By the irritation it produces about the neck of the bladder the moment the urine begins to flow, a degree of strangury occurs sufficient to awaken the patient, and thus prevent the evacuation taking place in bed. This effect being repeated for several nights in succession, the habit upon which the involuntary discharge takes place is entirely broken up, or the child will become accustomed to awake when the desire to urinate occurs, and thus all the disagreeable consequences resulting from the infirmity be prevented. The dose varies with the age, from 3 to 10 or 15 minims of the tincture, thrice daily, until a slight degree of strangury is induced. If this latter become troublesome, the drug must be discontinued or reduced in quantity or frequency, and mild mucilaginous drinks, with emollient or anodyne enemata, administered.

Benzoic acid, where the urine is high-colored and of strong odor, may be tried. Tincture of iodine in drop doses every two hours, lupulin, camphor, turpentine, ergot, zinc, large doses of potassæ nitratis, and numerous other remedies, have been suggested and tried with varying results.

Blisters to the sacrum, ice-bags to the spine, the application of astringents to the neck of the bladder, such as rhatany, iron, nitrate of silver, etc., have all been tried with success in some instances.

The hypodermic injection of strychnia, in the form of nitrate, one grain dissolved in two drachms of water, and seven to fifteen minims employed, *i. e.*, $\frac{1}{16}$ to $\frac{1}{8}$ of a grain, have been recommended, as also that of morphia and atropine in appropriate doses.

Acquired incontinence of urine, occurring for the most part in adults beyond the age of puberty, is chiefly due to displacements of the uterus, pressure from an enlarged uterus or pelvic tumors, injuries during parturition, disease affecting the bladder or urethra, and certain nervous disorders.

Incontinence of urine from *anterversion* or *flexion* of the uterus may be greatly relieved by a carefully adjusted cradle pessary. In some instances the insertion of an intra-uterine stem is justifiable. This is fully discussed under the head of Anteflexion.

Ante-version or -flexion of the gravid uterus during the early months of utero-gestation may also be relieved by a Hodge's or other form of pessary. In these cases we must be careful not to overlook the causal condition. Attention is not infrequently concentrated upon the symptoms of incontinence to the neglect of the former. We must be cautious not to mistake retention of urine,

with dribbling from overflow, for incontinence of urine. The passage of the gum-elastic catheter will serve both for diagnosis and treatment. This condition is by no means infrequent as a consequence of protracted parturition, and is unfortunately frequently overlooked.

Another condition, occurring under similar circumstances, though not manifesting itself until a week or ten days after the confinement, is incontinence of urine from a vesico-vaginal fistula. This accident seldom occurs from direct injury or laceration at the time, but generally from necrosis and sloughing, the result of pressure.

An operation is the only method of affording relief.

Incontinence of urine from vesico-vaginal fistula may also ensue from extension of malignant disease in cases of cancer of the uterus, or may be due merely to loss of power of the sphincter vesicæ from the tissues becoming involved. In these distressing cases, but little can be done to afford relief beyond attention to cleanliness, etc.

Disease of the nervous centres, as seen in cases of progressive general paralysis, is often accompanied by incontinence of urine. The use of the ordinary pouch urinal may here prove of service.

During the latter part of pregnancy, involuntary micturition, especially on coughing or standing, is not infrequent. A well-adjusted abdominal belt may assist in relieving the pressure.

After parturition, even though no unusual delay or difficulty has occurred, involuntary micturition may take place, persisting only for a few days or extending over a period of many weeks. The administration of strychnia or belladonna in these cases often proves of much service.

In patients who have had large families, or who have borne children rapidly, the power of control over the bladder is often weakened and very imperfect. The insertion of an inflated india-rubber ball in the vagina, so as to press upon the urethra, often remedies this defect. Ovarian tumors, by dragging on the bladder and mechanically interfering with the action of the sphincter, occasionally produce involuntary micturition or incontinence of urine. Cicatrices of the vagina, the result of parturition, may also produce a similar result. Division of the cicatrices may succeed in removing the difficulty.

Dilatation of the urethra, for the purpose of examining or removing foreign substances from the bladder, may cause permanent incontinence of urine. The application of the actual cautery bulb to the site of the sphincter has been recommended in these cases.

The use of the urethra as a vagina, where atresia of this latter canal exists, may lead to incontinence of urine. An operation to restore the patency of the vagina, so as to enable it to fulfil its proper function, is here indicated.

Spasm of the ureters from pressure of the gravid uterus has been mentioned as a cause of incontinence of urine. Change of position, with careful regulation of the bowels, may serve to relieve this condition.

CHAPTER XXXVII.

PRURITUS VULVÆ, VAGINÆ, AND ANI—UTERINE DYSKINESIA—
COCCYGODYNIA.

Pruritus Vulvæ.—This distressing affection consists in an irritability of the nerves supplying the vulva, evidenced by intense itching, burning heat, intolerable pricking and tingling, inducing or impelling the patient to relieve herself by rubbing or scratching the parts, which generally serves to increase the irritation and intensify or aggravate the original malady.

It is generally more or less intermittent in character, being worse just before and after menstruation, and even after eating or drinking, or after exertion, more especially in warm weather.

The warmth of bed almost invariably brings on a paroxysm, rendering the condition of the patient unbearable, necessitating her getting up every quarter of an hour or so, preventing sleep, and producing such an amount of nervous disturbance as not infrequently to cause fears of the mind giving way. It occurs more frequently in women advanced in life than in young women. Although affecting primarily the vulva, the irritation is not necessarily confined to this part alone, but has been known to extend up the vagina to the anus, down the thighs, and even in some cases over the abdomen.

Scratching or rubbing the parts, in place of allaying the irritation and affording relief, generally serves to aggravate the discomfort, and in time produces increased irritation and sets up secondary mischief which not infrequently complicates matters very considerably.

Under this head there is very little doubt that many very dissimilar conditions have been grouped.

In *Diabetes*, pruritus is a very frequently associated condition, the constitutional disorder being often regarded as the exciting cause, though there seems good ground for the belief that the local irritation of the urine constantly passing over the surface is the real exciting cause, as, if the catheter be regularly employed and the strictest cleanliness resorted to, the irritation soon subsides. Internally, *sodii salicylate* gr. xv, 4tis horis, may be tried.

In cases of pruritus where no apparent cause for it exists, the urine should always be examined for sugar.

Pregnancy is often a predisposing cause of pruritus, more especially during the early months, when the digestive organs are often allowed to get out of order, the bowels confined, hæmorrhoids often resulting in consequence; where an increased leucorrhœal discharge is present; where but little exercise is taken; and not infrequently unwholesome diet indulged in.

These, coupled with the fact of the nervous system being in a state of peculiar erethism, and the pelvic organs more or less actively congested, are quite sufficient to explain the occurrence.

In *Gouty* diathesis or lithiasis we often meet with a very irritable condition of the surface of the body, from the constant circulation of excretory products, and in these cases the vulva is often especially implicated.

Pruritus has been noted by many as one of the earliest indications of *malignant disease* of the uterus or vagina. In these cases there is often a thin acrid discharge of peculiarly irritating and excoriating qualities, which no doubt is mainly instrumental in producing the irritation.

The *climacteric* age seems favorable to the development of pruritus. The action of the liver being sluggish, it may be from want of proper exercise on the part of the patient, and an undue indulgence in nitrogenous and carbonaceous food, is still further interfered with by the habit, too frequently indulged in, of resorting to alcohol in its various forms, and pruritus as a natural consequence results.

The custom of immoderate *tea*-drinking, more especially by those who have taken a pledge of temperance, is a by no means infrequent cause of pruritus.

Opium-eaters, or those who indulge in narcotics, whether to assuage pain, relieve cough, or procure sleep, are often subject to troublesome pruritus.

Dram-drinkers, particularly those who indulge in neat spirits, are prone to suffer from a most intractable form of pruritus.

Prurigo senilis is another form of this malady.

There are certain local conditions which cause a considerable amount of irritation and must not be overlooked. Of these, *pediculi*, *scabies*, *herpes*, *eczema*, *erythema*, and *lichen* may be mentioned, to which special attention should be directed.

Ascarides migrating from the rectum, *vulvar folliculitis*, *aphthæ*, acrid condition of the *secretion* of the sebaceous glands of the vulva, *warts*, etc., may also give rise to symptoms of pruritus.

Thomas mentions the growth of short, bristly hairs on the mucous surface of the labia as productive of irritation at times.

Uterine Disorders.—Any congestive or inflammatory condition of the uterus that gives rise to leucorrhœa, such as met with in the early months of pregnancy, at the climacteric period, etc., is very liable to induce pruritus. The so-called leucorrhœa resulting from granular condition of the cervix, or endometritis, is much more liable to produce irritation than ordinary vaginal leucorrhœa.

Treatment.—The first and foremost indication is to ascertain, if possible, the predisposing and exciting causes. No empirical treatment is likely to prove of service unless we have first ascertained what is the cause of the malady. Having done this, relief is far more likely to follow well-directed efforts for its removal.

The *general* or *constitutional* treatment will consist in obviating everything likely to keep up irritation. The diet must be properly

regulated, the bowels kept in good order, the digestion attended to, light and easy assimilable food being alone allowed; a healthy action of the skin, by means of warm baths, encouraged; small doses of blue pill to act upon the liver, followed by some saline aperient in the morning; the amount of exercise regulated, and the general health brought into as satisfactory a condition as possible. Mineral acids, with nux vomica and cinchona, or other appropriate tonic, will often prove of service when the health has been much deteriorated by broken rest, constant irritation, and disordered secretions.

It may be necessary at once to resort to *palliative* treatment before sufficient time has elapsed for the curative treatment to have had a fair chance. Bromide of potassium (ʒj to ʒss) is one of our most reliable remedies in allaying nervous disturbance. This may be combined with chloral at bedtime in order to ensure sleep. Digitalis has been given with good effect in these cases. If necessary, opium may be employed, but not if sleep can be procured by other means, as it not infrequently aggravates the disorder.

Local Treatment.—Any associated condition, whether the apparent cause of the disorder or merely the effect, must be removed if possible. Strict cleanliness must be insisted on, the parts being bathed with warm water in which a handful of oatmeal or bran has been mixed, or the vaginal douche employed where the pruritus seems to depend upon uterine disorder. Sponging with as hot water as the patient can bear will often afford marked relief. Some soothing lotion, such as infusion of tobacco, or a lotion containing borax, carbolic acid, morphia, atropine, acetate of lead, hydrocyanic acid, laudanum; poppy-head fomentations, etc.; will generally be requisite. These will be found more particularly indicated under the various causative conditions.

Some of the most useful formulæ are the following:

Hydrarg. perchl. ʒss, tinct. opii ʒj, aquæ ʒviij.—M.

Acid. hydrocyan. dil. ʒij, plumbi subacet. ʒj, aquæ ʒviij.—M.

Sodæ biborat. ʒss, morphiæ sulphat. gr. iv, lotionis nigræ, ʒviij.—M.

Atropiæ sulph. gr. j, acid. hydrocyan. dil. ʒj, glyc. boracis ʒj, aq. ʒviij.—M.

Acidi nitrici dil. ʒij, tinct. opii ʒij–ʒiv, aquæ ʒviij.—M.

Ammon. chlor. ʒss, spir. vini rect. ʒj, aquæ laurocerasi ʒvjss.—M.

Glyc. ac. carbol. ʒss, glyc. boracis, ʒj, aquæ ʒvjss.—M.

Zinci sulpho-carbolat. ʒiv, aquæ ʒviij.—M.

Acid. salicylic. gr. xl–lx, ol. theobromæ ʒij, cetacei ʒij, ol. amygdalæ dulcis ʒiv.—M.

Goodell recommends the following applications:

R Iodoformi ʒj, balsam peruviani ʒj.—M. Smear the parts with a brush.

R Acidi acetici ʒj, glycerinæ ʒiij.—M. Apply locally.

R Acidi carbolici gr. xij, morphiæ acetatis gr. viij, acid. hydrocyan. dil. ʒij, glycerinæ ʒj, aquam ad ʒiv.—M. Apply locally.

R Sodæ biboratis ʒj, morphiæ muriatis ʒj, acid. hydrocyan. dil.

ʒj, glycerinæ ʒj, aquam rosæ ad ʒviij.—M. Apply with a soft sponge.

R Sodii bisulphat. ʒvj, aquæ ʒvj.—M. Apply with a soft sponge.

R Chlorali, camphoræ āā ʒiv. Rub these into an oil, then add ungt. simplicis ʒj, pulv. acidi boracici ʒiv.—M. Apply with a brush.

R Ungt. hydrarg. nitrat., olei morrhue āā ʒj.—M. Anoint the parts twice daily.

R Chloroformi ʒj, olei amygdalæ expressi ʒvij.—M. Apply to the itching parts.

R Potassii cyanidi gr. j-iiij, liquoris calcis ʒiv, adipis ʒiv.—M. Apply locally.

R Hydrarg. perchloridi gr. j, pulv. aluminis ʒj, amyli ʒiss, aquæ ʒvj.—M. Apply locally.

Should *diabetes* be found to exist, the most scrupulous cleanliness after micturition, or even the employment of the catheter, may be resorted to.

In cases of *pregnancy* the cervix must be carefully examined; if granular erosion be found to be present the surface must be touched lightly with nitric or carbolic acid, nitrate of silver, or other caustic. A lotion containing borax, alum, zinc, or tannin, or the acetate of lead ʒj ad Oj aquam, or carbolic acid (one in forty) should be injected *per vaginam* night and morning. A plug of cotton-wool may be inserted gently just within the vaginal orifice to prevent any acrid discharges coming down and irritating the vulva, and removed morning and evening before using the syringe.

The digestion must be attended to, the bowels regulated by the employment of some simple laxatives, such as the confection of senna, liquorice powder, tamar indien, Hunyadi Janos water, Friedrichshall, or other saline.

Bromide of potassium is of service in allaying nervous disturbance, and may be combined with chloral at bedtime if sleep be disturbed.

The smoking of tobacco has been found efficacious in some cases.

Where a *gouty diathesis* exists, a mercurial purge followed up by Carlsbad salts or other saline aperient; a pill of colchicum, podophyllin, and aloes; strict attention to diet, both as to quality and quantity, abstention from alcohol and the administration of a mixture containing taraxacum, potash or soda, gentian, etc., will probably prove of service. Bromide of potassium is also indicated.

A similar plan of treatment will probably be necessary in cases at the *climacteric*; the diet being restricted, such agents as tea, coffee, and alcohol being either withheld or taken in strict moderation.

An infusion of tobacco, to which a little eau-de-cologne has been added to disguise the odor, often forms a useful application. An ointment of chloroform ʒj, and oil of bitter almonds ʒj, or vaseline ʒj, may also be tried.

In *prurigo senilis*, where the vulva is more particularly affected than other parts of the body, as occasionally happens, an ointment composed of one part of the oil of the seed of stavesacre to seven

of lard, or a plasma formed of flowers of sulphur and water, will generally prove beneficial.

The treatment of any local condition will depend upon its nature. Where *crab-lice* (*pediculi pubis*) are suspected, careful inspection of the pubes must be resorted to. The lice will almost invariably be found clinging closely to the hairs. They are visible to the naked eye as little dark specks. It is difficult to remove them unless a hair be extracted, so tenacious is their grip. The most efficacious method of getting rid of them is unquestionably the careful application of chloroform locally, which destroys them instantly, or a lotion of chloroform \mathfrak{ss} , spir. vini rect. \mathfrak{ij} , liq. hydrarg. perchl. \mathfrak{ijss} , may be applied frequently by the patient herself. Blue ointment (ungt. hydrarg.) is a favorite remedy with many, but lotions are equally efficacious and far more cleanly. Carbolic acid \mathfrak{ij} , and olive oil \mathfrak{ij} , also forms an efficient remedy. Ungt. hydrarg. ammoniati (white precipitate ointment) is often used; turpentine, infusion of tobacco, and dusting with calomel, have also proved useful.

If *scabies* be present, the sulphur or iodide of potassium ointment must be well rubbed in, or an ointment of carbolic acid.

In cases of *herpes*, dusting the surface over with oxide of zinc and starch, to which a little camphor has been added, or the application of the zinc ointment, will often be sufficient to allay the irritation.

Eczema, so-called intertrigo, affecting the vulva, groins, and flexures of the skin at the upper part of the thighs is often a cause of intense irritation. It may be due to uncleanness, irritating lotions, extension of inflammation in gonorrhœa, etc. It is very apt to occur in stout, plethoric women of a gouty diathesis, and often proves very intractable.

Where the case is one of long standing, it will be better to cleanse the whole of the affected surface by means of a little alkaline wash or thin gruel, and then paint the skin over with a strong solution of nitrate of silver (\mathfrak{ij} ad \mathfrak{ij}) or carbolic acid (\mathfrak{iv} ad \mathfrak{iv} glycerin). In simple cases, dusting the surface over with a powder composed of oxide of zinc (\mathfrak{ss}), and powdered starch (\mathfrak{ss}); coating the surface over with collodion; the occasional application of oil, which must be washed off carefully at least every twelve hours; keeping the parts well separated by a little cotton-wool or lint, carefully avoiding the risk of any leucorrhœal discharge getting to the parts, together with appropriate constitutional remedies, such as arsenic, iron, etc., will generally prove sufficient.

In some cases a combination of colchicum with alkalies, bromide of potassium, etc., will be advisable. Quinine, as a rule, is not well tolerated in these cases.

Where *lichen* appears to be the cause of the irritation, bismuth and alkalies internally, with occasional saline purgatives and the application of soothing lotions, such as borax (\mathfrak{ij}) and hydrocyanic acid (\mathfrak{ij}), or atropine (gr. \mathfrak{j}), or morphia (gr. $\mathfrak{i-ij}$) ad aquam (\mathfrak{viiij}), or nitric acid lotion (\mathfrak{ij} ad \mathfrak{viiij}), or carbolic acid lotion (\mathfrak{ss} ad \mathfrak{viiij}), will generally serve to allay the irritation.

If *ascarides* be detected, the vagina must be carefully washed out with borax or carbolic acid lotion (3ss ad Oj). A solution of ordinary salt (3ss ad Oj), or of tincture of iron (3ss ad Oj), or infusion of quassia, must be injected *per rectum*, and the patient put on a mixture of iron and quinine, in combination with strychnia and quassia or calumba, the bowels carefully regulated and the injection repeated if considered necessary.

If **follicular vulvitis** be present, strict cleanliness must be observed, fomentations or poultices being applied if requisite. Touching the inflamed points with the solid nitrate of silver often acts very beneficially. The parts may then be swathed and protected from further irritation by smearing over the surface chloroform (3j) and almond oil (3j), or dilute hydrocyanic acid (3j) with acetate of lead (gr. x) and vaseline or spermaceti ointment (3j). This condition is not infrequently met with during pregnancy.

Where *aphthæ* exist, a solution of borax (3iv) with morphia (gr. viij) in rose-water (3viij) will be found very efficacious, or a combination of the glycerate of borax (3j) with glycerate of carbolic acid (3ij-3iv) in rose-water (3viij).

An ointment of ungt. hydrarg. oxidi rubrum (3iv) with cod-liver oil (3iv) has also been found very successful.

Should any *warts* be found, they must be removed by sharp-curved scissors and an astringent lotion, such as zinci sulph. (gr. x-xx) aquæ (3j) applied for a few days, the parts being dusted over with calomel and kept very dry if any tendency to their recurrence be noticed.

If any short, *bristly hairs* on the mucous surface of the labia be detected, they must be removed by depilation, a pair of forceps, aided by the use of a magnifying-glass, being employed.

Where there is no abnormal condition of the vulva other than what can be attributed to scratching, care should be taken to examine carefully the condition of the uterus and vagina. It will frequently be found that some unhealthy secretion from the os or cervix, or from the vagina itself, more especially during the early months of pregnancy and at the climacteric period, by passing over the skin causes considerable irritation and produces the most intolerable itching, smarting, or burning.

Should the os uteri be found to be granular, the application of the nitrate of silver, carbolic acid, or other caustic, as before mentioned, must be resorted to.

If any uterine mischief exist, it must be treated on ordinary principles; frequent vaginal ablutions, sitz baths, soothing lotions, and other remedies being used as may be indicated. It is in these cases specially that a plug of cotton-wool inserted just within the vaginal orifice serves to prevent any secretion coming down to irritate the parts, and thus removes the exciting cause of the pruritis. The "vaginal rest" occasionally proves an effectual remedy in those cases where it is more pruritus vaginæ than vulvæ.

Pruritus vaginæ generally occurs in conjunction with pruritus vulvæ, but may occasionally be found to exist as a primary affec-

tion. It may be idiopathic, or symptomatic of disease in the uterus, vagina, or ovaries.

The symptoms resemble those mentioned under pruritus vulvæ, excepting that the irritation is confined to the vagina.

The idiopathic affection occurs mostly in elderly patients.

The disorder has been observed as symptomatic of flexions and displacements of the uterus, fibroids, and cancer.

It is often most marked during menstruation.

Treatment.—The affection is more amenable to treatment when it occurs as a simple neurosis, and is not symptomatic of any organic affection.

Hip-baths, injections of hot or cold water, astringent injections of alum or zinc, or of carbolic acid or borax, regulation of the bowels, attention to diet and exercise, may first be tried.

Painting the vagina over with a strong solution of nitrate of silver (5ss ad ʒj aq.), or of carbolic acid, will often prove of much service.

Wearing the vaginal rest should never be neglected in obstinate cases.

Pruritus Ani.

This may be merely an extension of pruritus vulvæ, or may be a distinctly separate affection, consisting of a painful itching or irritation of the anus, very distressing to the patient, often very intractable, generally worse at night, especially aggravated by the warmth of bed, as also by exercise, and even coming into a warm room after being out in the cold air.

The irritation is often so bad at night as to preclude sleep, making the patient so inexpressibly wretched that she is almost driven to commit suicide; the scratching, instead of allaying, only serving to increase the irritation. On examination the skin is found to be in a very irritable condition, frequently moist, sometimes eczematous, at others dry and rugose, red from scratching, or covered with minute scales.

When the disorder is severe and of long standing, Mr. Allingham has called attention to the fact that the skin is of a dull, dead white color from loss of the natural pigment, the skin looking more like very white parchment than natural integument, and on pinching it up is found to have lost its normal elasticity.

Causes.—Any gouty tendency, lithic acid diathesis, affections of the liver, internal hæmorrhoids, or habitual constipation, will naturally predispose to this affection.

Any local irritation in the form of eczema, leucorrhœa from uterine disorders, ascarides, etc., may prove to be the exciting cause.

Immoderate eating, deficient exercise, excessive indulgence in alcohol, tea, or coffee, will frequently be found to explain the occurrence of the malady. Certain errors in diet, such as the indulgence in high game, decayed cheese, curries, pickles, crab and lobster, in some cases salmon, are prone to produce considerable pruritus.

Effervescing drinks, such as champagne, bottled ale, etc., will sometimes cause it.

Treatment.—This is far less simple than might at first sight appear. We have seen that the malady is often very intractable. This is partly owing to the difficulty experienced in convincing patients of the necessity of giving up certain articles of diet, and also of persevering sufficiently long with any plan of treatment. The constitutional treatment will mainly consist in getting the general health into as good a state as possible. A strict dietary must be enforced; stout, plethoric people must be warned to avoid excessive eating, to abstain from all rich and highly-seasoned dishes, especially from anything that has been proved by experience to aggravate the disorder, to eat but little meat, taking in place of it fish or poultry.

Vegetables and ripe fruits, where they agree and there is no particular gouty tendency, may be recommended. As a rule, beer, wine, spirits, coffee, and tea should be given up, for a time at least, or only a little weak tea with plenty of milk allowed at breakfast, some form of cocoa or cocoatina being preferable. Where the patient happens to be anæmic, a little sound claret or Burgundy, with Apollinaris, Seltzer, Vichy, or soda-water, may be taken at lunch and dinner. Regular daily exercise short of fatigue should be enjoined; a good brisk walk of half an hour being better than a long stroll, the action of the skin being thereby encouraged. This latter must also be favored by occasional warm or Turkish baths, daily sitz baths or ablutions, friction with a rough towel, appropriate clothing, flannel next the skin, etc.

Any tendency to constipation must be obviated by means of Carlsbad salts, a combination of the acid tartrate of potash with confection of senna, Hunyadi Janos or Friedrichshall water, or a mixture of sulphate and carbonate of magnesia. A very useful formula is mag. sulph. \mathfrak{z} ss, mag. carb. pond. \mathfrak{z} j, vini colchici \mathfrak{z} j, syrup. sennæ \mathfrak{z} iss, inf. chirateæ ad \mathfrak{z} vij. One tablespoonful to be taken twice or thrice daily, depending upon the effect produced, in a wineglassful of water. In some cases pil. rhei c. hydr. gr. v-x, alternate nights, with some aperient water in the early morning, for a few times, will prove of great service. A tonic and aperient mixture such as the following: mag. sulph. \mathfrak{z} ss, ferri sulph. gr. xx, tinct. nucis vom. \mathfrak{z} ij, acid. sulph. dil. \mathfrak{z} j, tinct. cinchonæ \mathfrak{z} ss, tinct. quassiae ad \mathfrak{z} vj—a tablespoonful in a wineglassful of water, twice or thrice daily, is extremely useful in elderly or debilitated patients.

The mere fact of having the bowels relieved before going to bed instead of after breakfast, as usual, will in some cases lessen considerably the tendency to irritation.

Where the digestion is at all impaired, the teeth should be carefully looked to, defective mastication being a fruitful source of digestive troubles. An acid mixture after meals, such as acid. nitric. hydrochl. dil. \mathfrak{z} ij, tinct. nucis vomicæ \mathfrak{z} ij, tinct. cinchonæ \mathfrak{z} ss, tinct. chlor. co. \mathfrak{z} ij, syr. aurantii \mathfrak{z} j, aquæ ad \mathfrak{z} v.—M.—a tablespoonful in a wineglassful of water twice daily, will often be indicated.

In delicate, excitable patients of spare habit of body, arsenic and quinine are of great value, or a combination of the citrate of iron, quinine, and strychnia. Cod-liver oil is also of service. Where the sleep has been much disturbed from the nocturnal irritation, or where the patient has been overworked or had much mental worry, a combination of pot. bromid. gr. xv with chloral. hydrat. gr. xv at bedtime, or succus conii $\mathfrak{z}\text{j}$ -ij twice or thrice daily, will often be advisable. Opium internally should be avoided as a rule; it tends to constipate the bowels, and often aggravates the malady.

Local Treatment.—Although much may be done for these distressing cases by local applications, it should never be forgotten that constitutional treatment is almost invariably necessary, failure to relieve the patient or cure the malady often depending upon trusting too implicitly to local remedies.

Perfect cleanliness is essential; sponging with tepid water after the act of defæcation, washing the anus and surrounding parts every night with warm water and yellow or Castile soap; the insertion of a suppository of ext. bellad. gr. $\frac{1}{4}$ – $\frac{1}{2}$ at bedtime; the application of the glyc. ac. carbol. or either of the following: the glyc. ac. tannici, or the glycer. boracis; acid. carb. $\mathfrak{z}\text{j}$, ol. olivæ $\mathfrak{z}\text{ss}$; the oleate of mercury, 20 per cent.; ungt. hydr.; an ointment of hydr. subchlor. $\mathfrak{z}\text{j}$, camphor $\mathfrak{z}\text{ss}$, spir. vini rect. q.s., vaseline $\mathfrak{z}\text{vjss}$; or one of glyc. ac. carb. $\mathfrak{z}\text{j}$, chloroform $\mathfrak{z}\text{j}$, ungt. hydr. fort. $\mathfrak{z}\text{j}$, adipis benz. $\mathfrak{z}\text{v}$; chloroform pomade—chloroform $\mathfrak{z}\text{ij}$, glycer. boracis $\mathfrak{z}\text{ss}$, ungt. sambuci $\mathfrak{z}\text{ss}$; a lotion of acidi hydrocyan. (Scheele's) $\mathfrak{z}\text{ss}$, sol. morphiæ $\mathfrak{z}\text{j}$ and infusion of tobacco $\mathfrak{z}\text{ss}$ ad $\mathfrak{z}\text{vij}$; or one of glyc. boracis $\mathfrak{z}\text{j}$, morphiæ hydrochl. gr. xvj, acidi hydrocyanici dil. $\mathfrak{z}\text{ss}$, glycer. pur. $\mathfrak{z}\text{j}$, aquæ rosæ ad $\mathfrak{z}\text{viij}$, to dab the parts frequently.

In very obstinate, intractable cases, the application of a strong solution of nitrate of silver $\mathfrak{z}\text{j}$ – $\mathfrak{z}\text{ij}$ to the ounce of water, or of carbolic acid liquefied by heat and sufficient glycerin added to keep it from again solidifying, will often be requisite. This must be done carefully by the medical attendant himself, any undue irritation being allayed by the use of olive oil.

Some patients experience great benefit by keeping a small piece of oakum or marine lint constantly applied to the anus. Mr. Allingham speaks favorably of the introduction into the anus at bedtime of a bone plug, shaped like the nipple of an infant's feeding-bottle, with a circular shield to prevent it slipping into the bowel; the nipple should be about an inch and a half in length, and as thick as the end of the forefinger. This is most efficient in preventing the nocturnal itching; it should only be worn every other night.

Where internal hæmorrhoids are present, they should be removed. If uterine disorder be suspected, or there be any leucorrhœal discharge likely to cause or keep up irritation, this must be remedied.

If any parasitic vegetable growth be detected, a lotion of sulphurous acid $\mathfrak{z}\text{j}$ to $\mathfrak{z}\text{vj}$ of water will cure it. If ascarides be found,

the injection of a solution of salt, tincture of iron, or infusion of quassia will soon remove them.

Whatever treatment be pursued, it must be persevered with patiently; few cases are really incurable if only sufficient pains be taken to try and ascertain the exciting cause, and constitutional as well as local remedies be resorted to.

Uterine Dyskinesia.—Dr. Graily Hewitt asserts that impairment of the power of locomotion is a symptom and effect of uterine disease so common and so important that it deserves to be considered separately and distinctly. It was formerly spoken of as uterine lameness.

By uterine dyskinesia is meant an inability to walk or move or perform certain of the ordinary motions of the body without producing pain referable to the uterus, this pain being situated either in the sacral region or in the groin, and sometimes extending to the umbilicus.

This inability to perform certain motions without feeling pain referable to the uterus is not a paralysis in any sense of the word, at least in ordinary cases, though paralysis may occur to a more or less complete extent. Generally, however, the patient is perfectly able to move or walk, but the exertion always gives rise to pain.

Uterine dyskinesia is observed in almost all cases of flexion or distortion of the uterus. In acute flexions the tenderness is often extreme, and it is precisely these cases in which the lameness is a most prominent and noticeable symptom.

The existing flexion is always accompanied by more or less congestion, distention of the uterine tissues, and compression of certain other portions. It is the increased compression of uterine tissue at the seat of the flexion which is the principal cause of the actual pain. Experience shows that the pain on motion does not occur, or is very perceptibly diminished, when this compression is removed.

Coccygodynia and *coccyodynia* (ὀδύνη, pain) are the terms applied to designate pain in the situation of the coccyx.

In some instances, more especially in single women, where there is no history of accident or injury of any kind, the disease seems to be a neurosis or form of neuralgia analogous to pruritus vulvæ, depending upon irritation or morbid condition in the sexual organs, anus, or rectum.

In other instances, especially in those who have borne children, the disease is often due to injury or disease of the coccyx, or of its articulation, during the act of parturition.

When we consider that the coccyx serves as a point of attachment for the greater and lesser sacro-sciatic ligaments, the ischio-coccygei muscles, the sphincter and levator ani, as well as some few fibres of the glutei muscles, it will be readily understood that any movements of the body which throw any of these structures into activity will be liable to increase the pain, or rather to produce it; for, as a rule, no pain is experienced so long as the coccyx is uninfluenced by contraction of the muscles attached to it, whereas pain is instantly produced when these contract.

Luschka has described a glandula coccygea, situated between the levator ani and the posterior end of the external sphincter, just at the extremity of the coccyx. It is rich in nerves, which form a network perforating its stroma, and is connected with filaments from the ganglion impar of the sympathetic nerve. It is possible that this may in some cases be the seat of coccygodynia.

Causes.—Neurotic tendency; uterine, ovarian, and rectal disease; rheumatic condition of the ligaments or fibrous tissue; injuries resulting from parturition, as from fracture of an anchylosed coccyx, or from undue straining or rupture of the ligaments producing subsequent inflammation in the sacro-coccygeal joint; blows or falls upon the coccyx producing fracture or dislocation, or even inflammation in the joint.

Exercise on horseback; prolonged sedentary occupations.

Symptoms.—The most constant and characteristic symptoms are pain on defæcation, on sitting down, or in attempting to rise from the sitting posture. In some instances there is pain on walking or prolonged sitting. The pain is not always acute, nor at all times equally severe; it is aggravated by pressure, and, as a rule, is not present when the patient is lying down quietly. Some patients dread sitting down; they rest upon one hip only, or support themselves partially by placing one hand on the chair, leaning over to the opposite side. Before attempting to rise, especially from a low seat, which they generally instinctively avoid, the hands are placed upon the edge of the chair and the body thrown forwards, so as to avoid, as far as possible, putting any strain upon the parts affected.

Any sudden or violent movements produce such agony as to make the patient cry out.

Diagnosis.—With one finger inserted in the rectum, the other hand being pressed externally, intense pain is produced on pressure over the sacro-coccygeal joint, or on moving the coccyx. In some instances, however, there is no evidence of any lesion of the coccyx, but the presence of painful hæmorrhoids or fissure of the anus is detected.

Retroflexion of the uterus with acute metritis may occasionally be found to account for the intense pain.

Prognosis.—Instances are met with where after long and intense suffering the disease seems to wear itself out, the patient getting well spontaneously without treatment. Although the disease may last for years and cause considerable annoyance and distress, it is singular that the general health becomes so little impaired.

Treatment.—Where the affection seems to be more of a neurotic form, tonics, such as iron, strychnia, quinine, or arsenic; careful regulation of the bowels; counter-irritation; morphia suppositories, or the hypodermic injection of morphia over the seat of pain, or the application of chloroform and belladonna liniments, may first be tried. Any uterine, ovarian, or rectal disorder should be treated by appropriate remedies.

If local inflammatory symptoms be present, a few leeches may be applied to the part, followed up by counter-irritation.

Should these measures fail in affording relief, a radical cure of the affection must be had recourse to. This may generally be accomplished either by severing the attachments of all the coccygeal muscles or by extirpation of the coccyx itself.

In the former case a tenotomy knife is passed at the point of the coccyx, and carried up subcutaneously as far as the sacro-coccygeal joint. The coccyx is then entirely freed from all muscular attachments by an incision first on one side, then on the other, and lastly all round the tip of it.

There is seldom any hæmorrhage following this operation.

Should this method fail, or there is evidence of necrosis, the coccyx should be extirpated, by making an incision over it, severing its attachments, and disarticulating it with the scalpel, or removing it by a pair of bone forceps.

By one or other of these methods a complete cure can generally be effected. The after-treatment is such as would be pursued in any operation of a similar nature.

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
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